BREAK-IN

July/August 2012

The Official Journal of the
New Zealand Association of Radio Transmitters (Inc.)

Dedicated to

Amateur Radio and Electronics

in New Zealand since 1928

In this issue:

- The folded dipole and its derivatives; Part 1
- Down to basics with antennas; Part 2
- A 6 metre Moxon Portable Antenna
- The LogiTALKER voice keyer
- Physics; and the reality of amateur radio antennas
- My first radio build/construction/kit assembly
- "The Ballad of the Ham'
- NZART Conference 2012; AGM Minutes
- NZART Conference 2012 Nelson
- The Basics of "Ham Speak"; a tutorial
- Book Review; *"Valves Revisited"*
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*The term **break-in** refers to a system in CW whereby the transmitting station can hear the other station's signal during "key up" periods.*

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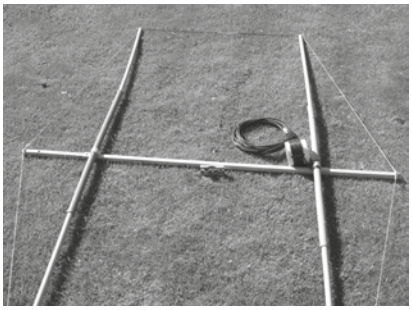

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From The Editor

John Walker ZL3IB
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During Queen's Birthday week-end Sheila and I joined some 170 plus members and their partners at the NZART Conference held in Nelson. This was a most enjoyable event and I am sure that participants would join with me in congratulating the organisers on providing such an excellent event. You can read more about the Conference elsewhere in this issue of *Break-In*.

In Craig Crawford's '*Break-In* 50 years ago' column he reminds us of the plans to incorporate amateur radio into the proposed Auckland Museum of Transport & Technology. This museum (MOTAT) is now a reality and I, like many of our members, will have enjoyed visiting it. There is a building devoted to "Telecommunications' but it is woefully small and is shared with land-line telephone and telegraphy displays etc. I do not wish to disparage these in any way but we end up with little space for the history of radio. There are also interesting, but small, displays of historical radio equipment in museums at Waikanae and Ferrymead, Christchurch and elsewhere.

I know that there are quite a number of radio amateurs and also members of the NZ Vintage Radio Society who have restored old "ham" gear and/or domestic radio equipment. Personally I have accumulated a collection of over 32 vintage communication receivers and wonder how to "find them a good home" sometime in the future and I know that there are others with similar problems. On a broader front there are significant hoards of older scientific laboratory equipment languishing in university departments etc but needing to be displayed.

My dream would be to see either a much enlarged Science & Technology section at MOTAT or, better still, a dedicated Science & Technology Museum along the lines of the Smithsonian or The Power House in Sydney or similar.

What do our members think ?

John Walker ZL3IB Editor

Next deadline for copy is
10 September 2012

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From The President

Vaughan Henderson ZL1TGC
<vaughan@bidecphone.co.nz>

I have not heard which weather pattern we can blame this winter's exceptionally cold conditions on, maybe I'm just getting older? Fortunately, the colder weather did not stop many of you from attending our AGM and Conference in Nelson. With a final registration figure of 175, Nelson Branch and the Conference team did a really great job of hosting the 2012 Conference. The weather was good, the venue was warm and comfortable and the food was good. Many thanks Nelson Branch, you promised us a "Hamtastic" weekend and delivered a fantastic one. Reports on the Conference weekend activities and the results of the AGM business are elsewhere in this issue.

I also very pleased to be able to advise that Wairarapa Branch 46 have offered to host next year's Conference. The venue for this conference will be at the Copthorne Hotel and Resort, probably better known to many of you as the Solway Park on High Street, Solway, Masterton A steering committee has been formed, with the following members having kindly offered their services; Neil Richardson ZL2UN, David Bray ZL2BA, Paul London ZL2BEF, Edwin O'Hara ZL2AHU, Robin Murray ZL2MUR and his wife Gill. I'm sure this team will put together a great conference, so mark Queen's Birthday weekend 2013 (June 1, 2 and 3) on your calendars now and Masterton will be the place to be!

As announced at our 2012 AGM in Nelson, Barry Stewart ZL2RR is our Amateur of the Year for 2011. I was able to travel to Wanganui to make the presentation to Barry at the Wanganui Branch 48 meeting on Monday 11 June. My thanks to Ivan ZL2ATU and his wife Pat for their hospitality and to the Wanganui Branch members for turning out to the meeting in good numbers to make the evening a really special occasion for Barry. The presentation was well reported in the local *Wanganui Chronicle*, the weekly *River City Press* and even made it into the CapitalDay Page of Wellington's *Dominion Post*. Congratulations from all of us Barry on a well deserved award.

At the Council meeting on Monday of Queen's Birthday weekend we considered a report from the IARU Committee which met over the conference weekend. In particular, there was a request from the committee to review the funding for the next Region 3 Conference being held in Ho Chi Minh City in November this year. Council had previously approved a budget of $7700 which allowed two people to attend. After consideration of the report, Council has agreed to increase this budget to $11 486 dollars which will allow three people to attend. This might seem to be excessive, that a small society like ours can afford to send three people and I'm sure some of you are not happy to read of this decision. Can I ask you to look at it like this; we need to safeguard our future and look to both promoting and protecting our valuable amateur radio spectrum. The IARU Conference later this year is where the ground work will be done to formulate the Amateur Radio approach to the next World Radio Conference which is only three years away, in 2015. It is this conference where agreement will be reached and support summoned from the other Region 3 societies for the continuing fight at ITU. Without this spade work, the effort of supporting our Administration at ITU, as seen through our attendance at WRC 2012 in Geneva earlier this year, will be of no avail. Many view this IARU conference as a "jolly". In practice, it is a week of concentrated work, the days are filled with rather difficult committee work and the evenings in continuing that work albeit in a social environment. As a society that is looked up to by so many of our fellow societies in the region, the NZART contingent is likely to be called on to take on leadership roles in the various working groups and committees with the inevitable heavier work load. There is a real possibility of a new amateur band at 5 MHz coming up at the next World Radio Conference in 2015. However, there is also pressure on that part of the radio spectrum from new applications, in particular oceanic radar systems. There is also no guarantee that all countries will support a new amateur allocation in this part of the spectrum. We need to be working now to help the other amateur radio societies in Region 3 convince their administrations to support this proposal for a 60 m amateur band. These things don't happen overnight and a strong team from NZART at the Region 3 Conference will help lay the groundwork for this proposed new band.

Westfest 2012. Bob McQuarrie ZL3TY advises that plans are under way for Westfest 2012 to be held in Murchison on the last weekend in August 25/26. Westfest it is an informal weekend with plenty of discussion of radio and ample time to socialise. To help out with the Westfest weekend, speakers are needed to tell us about what you are doing in ham radio, all subjects welcome provided it is radio related. If you think you can contribute please contact Bob on <zl3ty@nzart.org.nz>. It is a great opportunity to spread the word about your radio activities.

As advised in the last issue of *Break-In*, Council wants to encourage branches that have licences for repeaters, beacons and fixed links currently held in the name of NZART to take back ownership of these. HQ Infoline #250 lists all the Branches and affiliated organisations and has more detail on the costs and the advantage of a small saving to Branches for each licence if they pay the licence directly to the MED. If your Branch does not want to make payment direct to the MED, then the licence can stay in the name of NZART, however, the prompt payment discount offered by the MED will be retained by headquarters to offset the administrative overhead. If you have not done so yet, can I encourage your Branch to look at taking ownership of the licence(s). To start the licence transfer process, please send an email to FMTAG <fmtag@nzart.org.nz> to receive a helpful information pack.

Jamboree on the Air is coming up over Labour Weekend (October 21-23) and I understand that a number of Scout and Guide groups around the country are planning a three day camp to take advantage of the long weekend. Many of you will have plans for that weekend but if you still have some free time, and are not otherwise busy, how about getting in touch now with your local Scout or Guide organisation and see what you can do to help them. JOTA is an excellent opportunity to introduce amateur radio to younger people and I hope you will take advantage of this. Jim Parnell ZL2APE is our National co-ordinator for JOTA, so if you plan to take part, please let him know at <jim-p@ihug.co.nz> I hope the next issue of *Break-In* will have some ideas to help you make the JOTA weekend an interesting experience for young people in the Scout and Guide movements.

Finally, thanks to all those who took part in the NZART Memorial Contest over the weekend of July 7 and 8. Philip ZL2TZE and Paul ZL2CQ did a fine job promoting the contest and I believe as a result, the numbers participating were well up on last year.

Vaughan Henderson ZL1TGC
President NZART (Inc.)

Coming Up

It is hoped to print the following articles in the next issue of *Break-In:*

- What do they do with those big dishes? What is Radio Astronomy?
- JBOT; an SSB linear amplifier made from just a bunch of transistors.
- 30 m QRSS beacon transmitter.
- Using computer headsets for your transceiver.
- Two-Way Mobile Tests via High Voltage Transmission Lines (HVTL).

More copy is needed urgently

Contributions to Break-In

Break-In is a forum for NZART member's amateur radio projects, experiences, opinions and news. Your contributions and feedback is welcomed. Contact the Editor John Walker ZL3IB at <john.zl3ib@ihug.co.nz>

The Folded Dipole and its Derivatives Part 1

by David Conn VE3KL

(Reprinted from The Canadian Amateur, July/Aug 2011)

(Note: This article uses TCA HotLinks to provide access to enriched media from the RAC website. For more information, please go to <www.rac.ca/tca. July/Aug>*)*

Introduction

The classic two element folded dipole is a very old antenna that is important in its own right but even more so when you look at its many derivatives and how they work. Like all antennas, it is best to go back to the basic structures to gain an understanding of their operation and uses. In the case of the folded dipole, it consists of two components that must be understood: a shorted transmission line and two closely coupled dipoles.

Part I of this article lays the ground work of the operating principles of the two element folded dipole. A simple model for the folded dipole is built around our understanding of the basic halfwave dipole and a transmission line that is short circuited on one end. The model is confirmed with the use of the 4nec2 antenna simulator which is also used to predict the antenna resonant frequency and impedance.

The impedance of the two/three element folded dipole was included in the Proceedings of the Institute of Radio Engineers in 1950 and was subsequently reported to the Ham radio community by W2MM in a *QST* article in 1951 (see TCA Hotlink,1). An analytical approach was based on fundamental analysis but limited to a single frequency. Now that we have computer simulators and models that include transmission line techniques, it is quite easy to expand the studies to all sorts of similar structures (see TCA Hotlinks,2,3,4).

Part II of the series builds on part I by expanding the study to some of the two element folded dipole derivatives:

- The linearly loaded dipole.
- The terminated folded dipole.
- The Gamma match for vertical monopoles and Yagi antennas

The basics

The folded dipole antenna (see Figure 1) consists of two very closely spaced, S, dipoles that are fed in the center by a single source of power and connected together at their ends. In this study, I keep the spacing S set to 100 mm and all wire diameters set to 2 mm. The folded dipole looks more like a conventional two wire transmission line than an antenna. In the special case given in this part of the series, the characteristic impedance of the transmission line is 552 Ohms given by the formula:

$Z_o = 276 \, Log \, (2S/d) \, Ohms$

where ***S*** is the spacing between the wires and ***d*** is the wire diameter. These dimensions were chosen quite arbitrarily to demonstrate the operating principles of the antenna and to simplify the simulation requirements.

So why does it radiate?

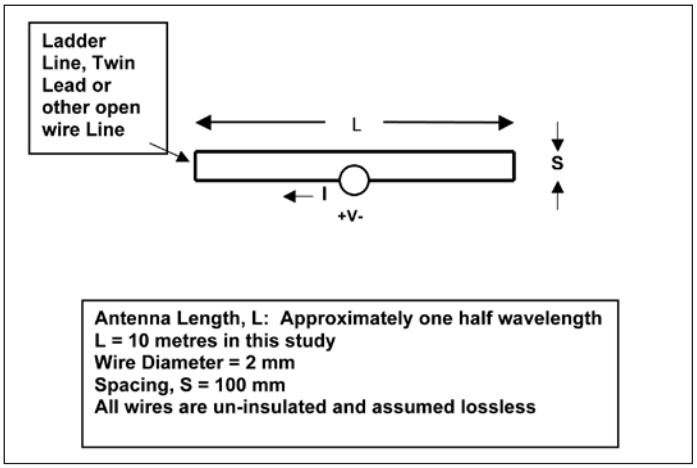
There are two important observations to make:

- A section of a transmission line will not radiate at all if the currents in the wires are equal in magnitude and opposite in phase. This is the way ordinary open wire transmission lines work. The current **f** owing into one wire returns through the other wire. If such a line feeds a balanced antenna, the feed line does not radiate in an ideal situation.
- In general, the currents in the folded dipole will not be equal in magnitude and phase; hence the antenna will radiate.

A circuit model for the folded dipole

The folded dipole can be difficult to analyze because it acts as a transmission line and two dipole antennas. This difficulty can be circumvented by decomposing the folded dipole into a simple transmission line and two dipoles; we know the answers for both of these and the resulting folded dipole impedance can be found in two simple steps.

The basic concept is shown in Figure 2, Circuit #1 that shows the folded dipole as it is built. It consists of a single source that feeds the


Ladder Line, Twin Lead or other open wire Line
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+V-
Antenna Length, L: Approximately one half wavelength
L = 10 metres in this study
Wire Diameter = 2 mm
Spacing, S = 100 mm
All wires are un-insulated and assumed lossless

Figure 1. Folded dipole: L = 10.0 metres, wire diameter = 2 mm, spacing = 100 mm.

wires in the center. Here we assume that the wires are fabricated from a section of transmission line with characteristic impedance of 552 Ohms as discussed previously. The antenna impedance is:

$Z \, folded\_dipole = V/I \;\; Ohms$

Where V is the applied voltage from the transmitter and I is the resulting current.

Circuits #2 and #3 in Figure 2 show how the antenna is decomposed into two separate circuits.

The method of analysis is to find the antenna currents **f** owing in the wires in each circuit and then add them together to get the total antenna current. This method relies on the concept of superposition that applies to linear systems like antennas when we neglect things like heating and excessive input power.

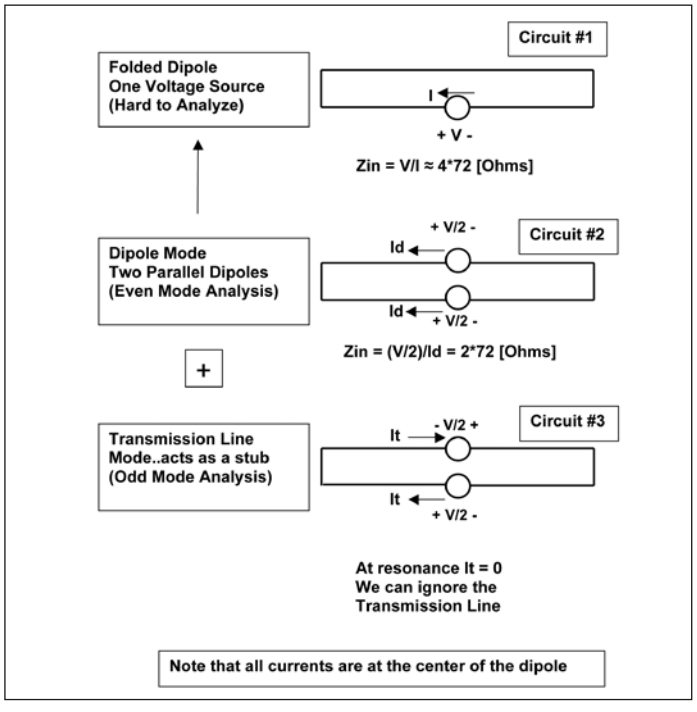


Figure 2. Folded dipole circuits: The antenna, dipole mode and transmission line mode.

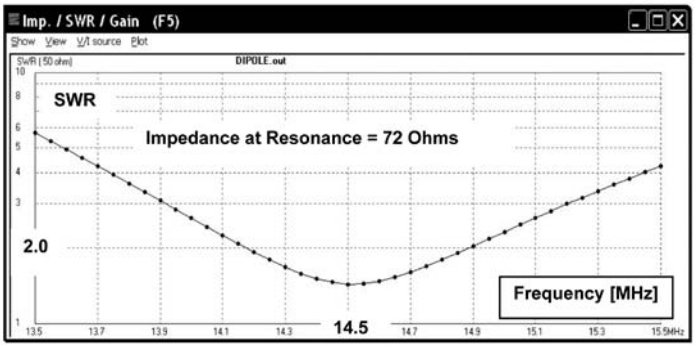


Figure 3. Simulated SWR of a basic dipole. Z at resonance = 72 Ohms.

Circuit #2

The voltage sources in circuit #2 are in phase; this means that the currents ***id*** in the top and bottom wires will be equal in both magnitude and phase. Hence, circuit #2 behaves like two very closely coupled dipole antennas. The impedance of a single halfwave dipole in free space is close to 72 Ohms but this will not be the case for the two coupled dipoles.

Circuit #3

Now, look at circuit #3 in Figure 2. In this case, the voltage sources are out of phase which produces a non-radiating current, ***It***, in each section of the transmission line. If each section of the line is one quarter wavelength long, the impedance looking into the line from the generators will appear as open circuits and no current f ows. Here we can ignore the impact of the transmission line component on the folded dipole at resonance. Keep in mind that this is a special case. In general, transmission line current f ows in parallel with the dipole current given in circuit #2.

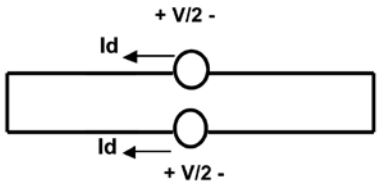
Important observations

There are important items to notice about circuit #2:

- The currents ***id*** in the lines are equal in magnitude and phase. They are equal because of the symmetry of the wires (equal in diameter in this case) and the fact that the voltages are equal. This causes radiation.
- Because of this symmetry, there is no current in the end wires (the vertical ones) which means that the system behaves as two single dipoles that are located very close to each other.
- The voltage source has a value of ***V/2*** which has the impact of doubling the input impedance to 144 Ohms (reducing the current) but this is not the complete story.
- These dipoles are extremely close together. That is, they are coupled like a tightly wound transformer. The resulting effect is that the antenna current is reduced by another factor of two and the impedance is equal to ***4Zd*** Ohms. That is:

Z folded dipole = 4Zd Ohms

Where *Zd* is the impedance of a single dipole at resonance located in free space.



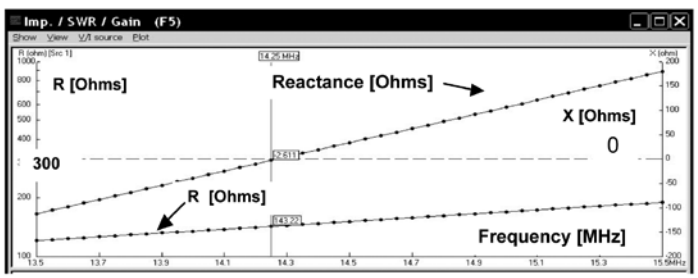


Figure 4. Simulated impedance of two closely spaced dipoles, Circuit #2, Figure 2: sources fed in-phase. This is called the dipole mode or even mode.

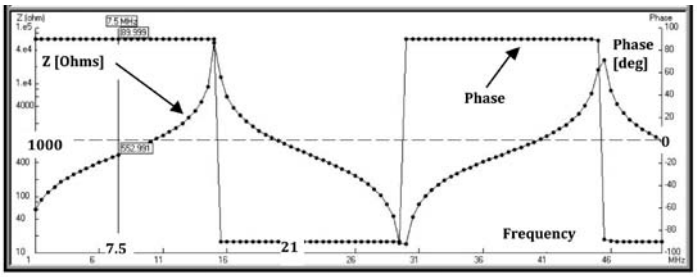


Figure 5. Simulated impedance circuit #3, Figure 2: Sources fed out of phase This is called the transmission line mode or odd mode.

- Since the wires are very close together, we expect the radiation pattern and antenna gain of the folded dipole to be the same as a single dipole.

The above analysis has several built-in limitations: the wire diameters are the same, the antenna is located in free space, the wires are lossless, the transmission line mode is neglected and the wires are closely spaced.

Modelling

W2MM (see TCA Hotlink, 1) described both the two and three element versions of the folded dipole and presented design curves for these dipoles. The impact on the input impedance of having different diameters was shown quite clearly by W2MM. This description was limited to the resonant condition.

This article shows the antenna characteristics of the folded dipole with the aid of 4nec2 antenna simulator. For those who are interested in a more detailed analysis of the folded dipole, I have included it on my Web site. The 4nec2 simulation files are also included.

The antenna simulation (see TCA Hotlink, 5) included in this article consists of four separate simulations:

- A simple dipole used as a reference to demonstrate the impedance and bandwidth of a reference dipole.
- The dipole mode using two generators, circuit #2 in Figure 2.
- The transmission line mode using two generators, circuit #3 in Figure 2, and
- The complete folded dipole, circuit #1 in Figure 2.

By decomposing the antenna into separate circuits, it becomes clear why the folded dipole has such a large bandwidth.

The simple dipole

The results for the simple dipole in free space are presented in Figure 3 as a reference.

Notice that that:

- The resonant frequency is nearly 14.55 MHz.
- The Impedance at resonance is close to 72 Ohms which

continued on page 6

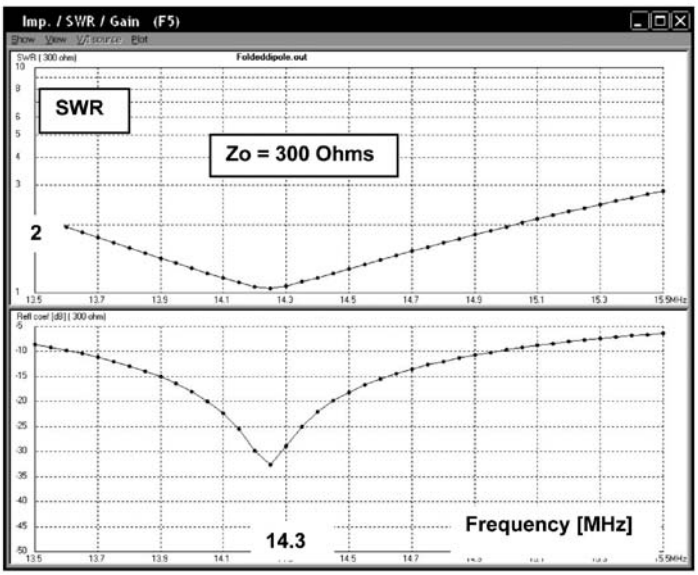


Figure 6. Simulation of the complete folded dipole. Z = 286 Ohms at resonance.

continued from page 5

corresponds to an SWR of 1.44 in a 50 Ohm system.
- The system looks capacitive (negative reactance) at frequencies below resonance and inductive (positive reactance) at frequencies above resonance.

Two coupled dipoles

Circuit #2 in Figure 2 was simulated to see if the impedance equals 144 Ohms as predicted by the simple theory. The voltage sources in this case are in phase. The results are shown in Figure 4 where the impedance (Real and Imaginary) are plotted as a function of frequency. The simulated impedance at resonance equals 143 Ohms. This value does not depend on the spacing, ***S***, or ***d*** as long as all of the wires have the same diameter. This means that the impedance will be the same for either a 300 or 450 Ohm transmission line. You can test this out for yourself by using my 4nec2 files on my Web site. By increasing the spacing S, you will see that the input impedance stays very close to 143 Ohms.

The non-radiating transmission line mode

Circuit #3 in Figure 2 was also simulated to show the impact of transmission line currents over a broad frequency range. The results are presented in Figure 5. where the magnitude and phase of the impedance is plotted as a function of frequency. Since the transmission line is lossless in this example, the impedance looks entirely reactive: either capacitive or inductive. As the frequency approaches zero, the transmission line looks like a small inductive loop where high currents f ow.

The simulation shows:
- The impedance goes to infinity at 15 MHz which corresponds to the frequency where the line is one quarter of a wavelength long. Remember that the antenna has a length of 10 metres.
- The inductive impedance at 7.5 MHz equals 553 Ohms which corresponds to the impedance of a quarter wavelength transmission line with characteristic impedance Zo equal to 553 Ohms.
- The transmission line looks like an inductor below resonance and a capacitor above resonance. This has a big impact on the bandwidth of the antenna.
- The impedance repeats periodically with frequency as expected form a shorted transmission line.

The complete folded dipole

The complete Folded Dipole given in circuit #1 of Figure 1 was finally simulated. The results are shown in Figure 6, which shows the SWR and ref ection coefficient of the antenna over a wide frequency band. The reference impedance for this study was 300 Ohms. Some observations are:
- The bandwidth for a 2:1 SWR is 1.4 MHz compared with 0.7 MHz for a single 20 metre dipole. This increase in bandwidth is due to the fact that the dipole impedance is capacitive below resonance while the transmission line is inductive; this causes a partial cancellation of the two effects.
- The impedance at resonance is 286 Ohms compared with 143 Ohms for circuit #2 in Figure 2 as expected.

Conclusions

This article presented an explanation of how a folded dipole works by using the idea of symmetry to decompose a difficult problem into two simple problems. The simulation results show that the bandwidth of the Folded Dipole is much larger than a single dipole and that the impedance is approximately 286 Ohms at resonance independent of the characteristic impedance of the transmission line that is used to fabricate the antenna.

More important though is the idea that the same reasoning and simulation techniques can be used to study many of the derivatives of the Folded Dipole. Some of these derivates are presented in Part II of this series with special emphasis given to the linearly loaded dipole.

It is clear from this study that the strengths of the Folded Dipole are its wide bandwidth and high impedance. Hence, it makes a good mono-band antenna for those who want to use ladder lines as the feeding structure. It can also be fed with coaxial cable with the aid of a 4:1 Balun.

Further study using TCA Hotlinks

Further information is provided with TCA Hotlinks which are easily accessed via the RAC website. For this information, please visit <http://www.rac.ca/tca July/Aug>. Hotlinks make it unnecessary to type URL addresses into your computer and provide you with calculators and other support that demonstrates the ideas presented in the articles. The following hotlinks for this article are available on the RAC site.

TCA Hotlink, 1 Transforming Impedance with Folded Dipoles, W2MM <http://www.arrl.org/arrl-periodicals-archive-search>

TCA Hotlink, 2 Folded Dipole Analysis, Thomas Milligan. <http://books.google.ca/books?id=PPyDQXAd09kC&pg=PA247&lpg=PA247&dq=folded+dipole+analysis&source=bl&ots=jmH6tStx2N&sig=UenZTxFnFsPJJcbkyKYf0yE7ILM&hl=en&ei=q5VfSvfCBo22-M5bQsK4C&sa=X&oi=book_result&ct=result&resnum=8#v=onepage&q=folded%20dipole%20analysis&f=false>

TCA Hotlink, 3 Folded Dipole Simulation, VK1OD. <http://vk1od.net/antenna/FoldedDipole/index.htm>

TCA Hotlink, 4 The Gamma Match (Similar to the Folded Dipole). <http://myweb.tiscali.co.uk/g8hqp/radio/gammamatch.pdf>

TCA Hotlink, 5 VE3KL Web site <http://ve3kl.com/>

Dave's Potpourri

In previous articles, I have recommend a very useful transmission line calculator called *TLDetails* by Dan Maguire, AC6LA. Dan now has an improved version of the calculator that improves the accuracy for low frequencies (better for 160 and 600 metre experimenters). It also contains a handy Smith Chart as before. The calculator is free to all of us and I would like to thank Dan for his dedication to Amateur Radio. Simply Google TLDetails and it will take you directly to the site where you can download the software.

Until later, VY 73, βi

David VE3KL

Break-In 50 Years Ago βi

Craig Crawford ZL3TLB

From *Break-In* August 1962

Museum of Transport and Technology

By Len Spackman ZL1AC

Several years ago, at one of the Auckland meetings of the Old Timers' Club, the suggestion was made that with the passage of time much old radio equipment which had been laying in "junk boxes" for years was being thrown away. Some of this useless junk was of considerable historical value and it was felt that steps should be taken, before it was too late, to have it arranged at some suitable museum so that posterity could see what radio stations looked like when "wireless' was in its infancy.

It so happened that about this time steps were being taken to form a Museum of Science and Technology and accordingly the sponsors of this body were contacted, and they immediately accepted the offer of the OTC.

At the Old Timers' Club meeting held at the NZART Convention in Wellington in 1960 the meeting formally resolved that the New Zealand OTC would accept responsibility of collecting and collating old radio gear.

It is possible to report that after many vicissitudes final arrangements are now in train and the Auckland Museum of Transport and Technology now looks like becoming a reality. An area of land at Western Springs has been obtained and a large number of very valuable exhibits have already been given and many more are promised.

The radio section will be part of a much larger Communications Section. All phases of radio and not only amateur radio will be covered. The primary objective of the museum will be educational and it is hoped to be able to store considerable material of technological interest which will not normally be displayed but which will be useful for special exhibitions and for the use of research workers.

As an example it is hoped to be able to set up a typical ship's radio cabin of the old spark era. It is also hoped to have a typical amateur radio station of the old days complete with its bread-board transmitter, slop jars and honeycomb coil receiver.

Down to basics with antennas; Part 2

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Antennas are the heart of every radio transmitter and receiver. So vital are they that it seems appropriate to look more closely at them. And whether you are experienced in their use or are coming to them for the first time, there is bound to be information here that could be useful.

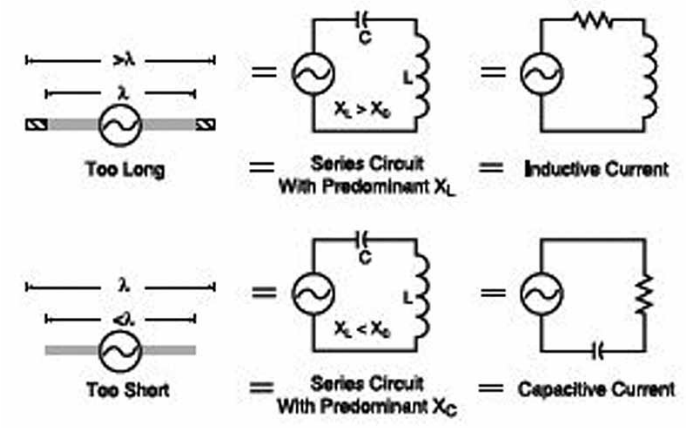

Figure 7. Antenna tuning.

Antenna tuning is the process whereby the resonant point of an antenna is adjusted. In most instances this is accomplished by physically adjusting the antenna length.

While simple range tests can be used to blindly tune an antenna, a network analyser is a virtual necessity for serious characterisation. In some cases external inductive or capacitive components may be used to match and bring the antenna to resonance. Such components can introduce loss. It should be remembered that match and resonance do not necessarily translate into effective propagation.

In addition to broad concepts of antenna function, there are specific issues of antenna performance that are equally important to consider.

The term radiation pattern is used to define the way in which the radio frequency energy is distributed or directed into free space.

The term isotropic antenna is commonly used to describe an antenna with a theoretically perfect radiation pattern. That is one which radiates electromagnetic energy equally well in all directions. Such an antenna is, of course, only theoretical and has never actually been built, but the isotropic model serves as a conceptual standard against which 'real world' antennas can be compared.

In the real world, an antenna will efficiently radiate RF energy in certain directions and poorly in others. The point(s) of greatest efficiency are called peaks while the areas of no field strength are called nulls.

The overall distribution characteristics of the antenna make up the radiation pattern. In many applications it is advantageous to have the antenna perform equally well in all directions.

In these instances a designer would choose an antenna style with an omnidirectional radiation pattern as such characteristics would be desirable. In instances where highly directional antenna characteristics are needed, an antenna style such as a Yagi would be chosen.

The term gain refers to the antenna's effective radiated power compared with the effective radiated power of some reference antenna. When the isotropic model is used, the gain will be stated in dBi (meaning gain in dB over isotropic).

When gain is being compared with a standard dipole, the rating will be stated in dBd (meaning gain over dipole). The generally accepted variation between isotropic and a standard dipole is 2.2 dB.

Thus, an antenna rated as having 15 dBi of gain would indicate the antenna had 15 dB of gain over isotropic or 12.8 dB of gain as compared with a standard single-element dipole. Gain is commonly misinterpreted as an increase in output power above

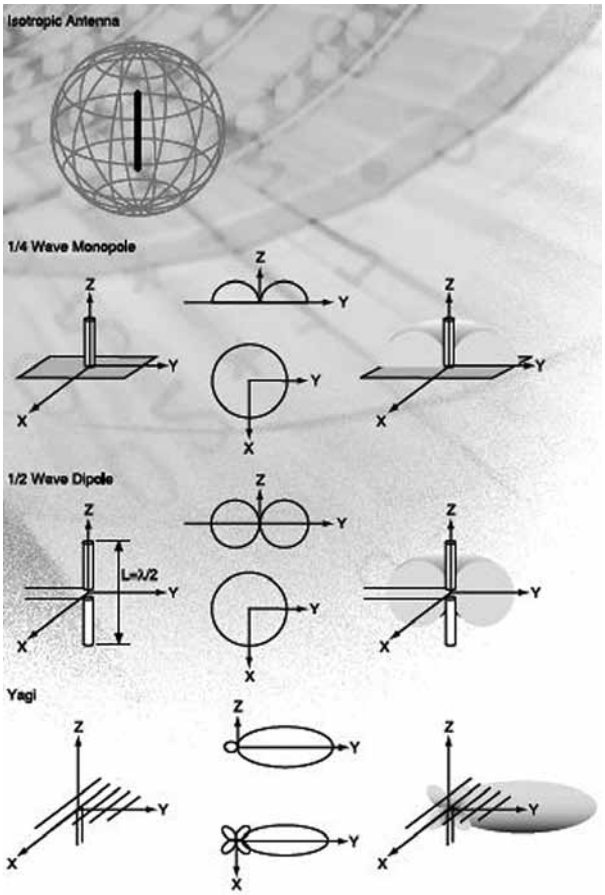

Figure 8. Antenna radiation patterns.

unity. Of course, this is impossible since the radiated power would be greater than the original power introduced to the antenna.

A simple way to understand gain is to think of a focusable light source. Assume the light output is constant and focused over a wide area. If the light were refocused to a spot, it would appear brighter because all the light energy is concentrated into a small area.

Even though the overall light output has remained constant, the light will have a gain in lux at the focus point over the original pattern.

In the same way, an antenna that focuses RF energy into a narrow beam can be said to have gain (at the point of focus) over an antenna that radiates equally in all directions.

In other words, the higher an antenna's gain the narrower the antenna's pattern and the better it's point performance will be.

The effective polarisation of an antenna is an important characteristic. Polarisation refers to the orientation of the lines of f ux in an electromagnetic field.

When an antenna is oriented horizontally with respect to ground it is said to be horizontally polarised. Likewise, when it is perpendicular to ground it is said to be vertically polarised.

The polarisation of an antenna normally parallels the active antenna element; thus, a horizontal antenna radiates and best receives fields having horizontal polarisation while a vertical antenna is best with vertically polarised fields.

If the transmitter and receiver's antennas are not oriented in the same polarisation, a certain amount of power will be lost. In many applications there is little control over the antenna orientation; however, to achieve maximum range the antennas should be oriented with like polarisation whenever possible.

In the VHF and UHF spectrums, horizontal polarisation will generally

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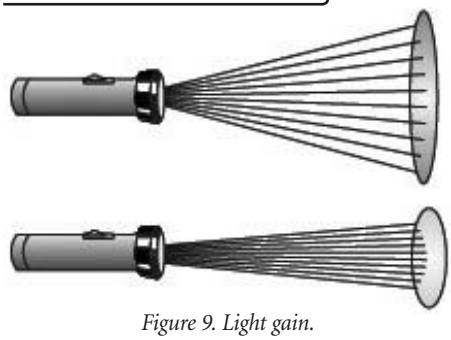


Figure 9. Light gain.

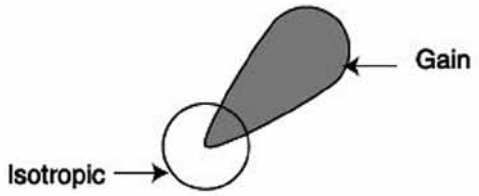


Figure 10. Antenna gain.

Figure 13. Whip antennas.

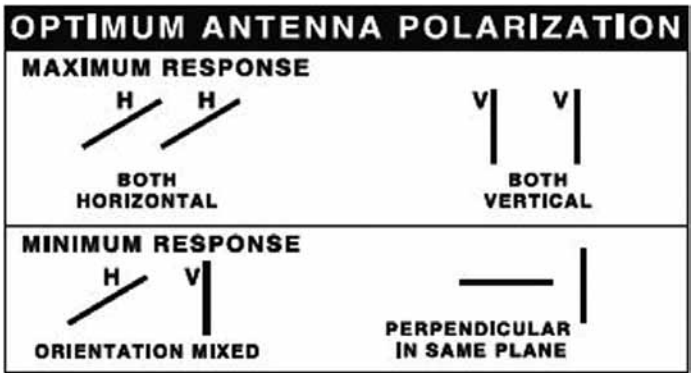


Figure 11. Antenna polarisation.

provide better noise immunity and less fading than vertical polarisation.

Not all the power delivered into the antenna element is radiated into space. Some power is dissipated by the antenna and some is immediately absorbed by surrounding materials.

Forward power – the power originally applied to the antenna input.

Reflected power – a portion of the forward power ref ected back towards the amplifier due to a mismatch at the antenna port.

Net power – the power applied to the antenna that actually transitions into free space is called the net power or effective radiated power. Net power is usually calculated by finding the difference between the actual forward and ref ected power values.

Multipath fading is a form of fading caused by signals arriving at the receiving antenna in different phases.

This effect is due to the fact that a signal may travel many different paths before arriving at the antenna. Some portions of the original signal may travel to the receiver's antenna via a direct free space path. Others, which have been ref ected, travel longer paths before arrival.

The longer path taken by the ref ected waves will slightly delay their arrival time from that of the free space wave. This creates an out-of-phase relationship between the two signals.

The resulting voltage imposed on the receiving antenna will vary based on the phase relationship of all signals arriving at the antenna.

While this effect is environmental and not related directly to the antenna, it is still important to understand the role multipath may play in theoretical vs realised antenna performance.

A whip-style antenna provides exceptional performance and stability. A straight whip has a wide bandwidth and is easily designed and integrated. Many designers opt for the reliable performance and cosmetic appeal of professionally made antennas, such as those offered by Linx.

These 'off-the-shelf' whip designs are generally made from a wire or cable encapsulated in a rubber or plastic housing. A whip can also be made by cutting a piece of wire or rod to the appropriate length.

Since a full-wave whip is generally quite long and its impedance high, most whips are either a ¼ or ½ wave. The correct length can be found using the formula in the section entitled 'How is Antenna Length Determined?'

A helical element is a wire coil usually wound from steel, copper or brass. By winding the element its overall physical length can be greatly reduced. The element may be enclosed inside the antenna housing or exposed for internal mounting.

A helical antenna significantly reduces the physical size of the antenna; however, this reduction is not without a price. Because a helical has a high Q factor, its bandwidth is very narrow and the spacing of the coils has a pronounced effect on antenna performance.

The antenna is prone to rapid detuning especially in proximity to objects. A well-designed helical can achieve excellent performance while maintaining a compact size.

Helical antenna design is a bit more complex than that of a straight antenna. It is possible to calculate the length of a helical once the diameter, material type and coil spacing are known.

In most cases, however, it is just as easy to arrive at a design empirically by taking an excessively long coil and tuning it by clipping until it is resonant at the desired frequency. The length may then be calculated by the turns and radius values or simply by straightening the coil and measuring it.

The last style of antenna to discuss is the loop trace. This style is popular in low-cost applications since it can be easily concealed and adds little to overall product cost.

The element is generally printed directly onto the product's PCB and can be made self-resonant or externally resonated with discrete components. The actual layout is usually product specific.

Despite its cost advantages, PCB antenna styles are generally inefficient and useful only for short-range applications. A loop can be very difficult to tune and match and is also sensitive to changes in layout or substrate dielectric constant.

This can introduce consistency issues into the production process. In addition, printed styles are difficult to engineer, requiring the use

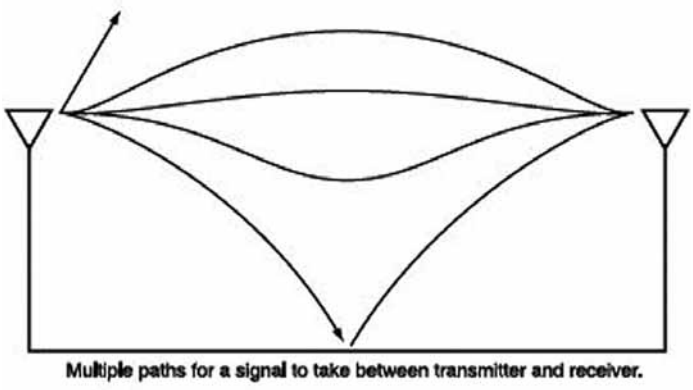


Figure 12. Multipath.

Figure 14. Helical antennas.

Figure 15. PCB antennas.

My First Radio Build/construction/kit assembly

by "Topsy" Scot ZL2LS

When we were organizing Conference and looking for forums we decided that we would ask Rory Deans ZL3HB and Kelvin Barnsdale ZL3KB if they would be interested in doing a Radio Tek talk. They were keen, but when they came back and suggested how about doing a hands-on and build a radio, well we were really keen.

Topsy happy as can be with the soldering iron finally in hand
Heads down, soldering iron in hand, Topsy ZL2LS and Sharon ZL2BQ at the Radio Tek build at Conference.

I don't think they really realized what they were letting themselves in for when we told them that both Sharon ZL2BQ and I Topsy ZL2LS were on the list to build our first ever radio.

Conference arrived, we got through registrations Friday night and Saturday and then Sunday arrived and we had to wait until after afternoon tea and then we could get our hands on the soldering iron. We had been waiting for this moment for ages. Sharon, Margaret Duffy and I were the only girls in the class but we didn't care, we wanted to build a radio. You didn't know how excited we were. We are not allowed in the husbands' shacks at home, let alone get our hands on their soldering irons.

We had a short presentation then we were handed our equipment and instructions. I am sure at that point both Rory and Kelvin were thinking what have we let ourselves in for, but they didn't let on how they were feeling, but we were feeling great.

It was like paint by numbers but different, we had a picture/ diagram with things on it that we had to get, and after putting the foil down on the diagram where we had to, we had to find the correct components and place them in the appropriate place which had been foiled. We were then allowed to solder our little circuits and other things together.

It was such fun, and by this stage both Rory and Kelvin were being so great by helping with some bits that were not quite right so to speak.

Hot glue on fingers, bits of solder here and there, and a couple of broken components and I was done; well I thought I was. Turn it on and guess what, it didn't go !!!! ahhhh; what did I do wrong? Kelvin to the rescue; Please help!

After a few modifications and replacement of a broken component and one other thing and a little bit of help I got stage one of the radio finished. Now came the crunch time, turn it on again and, *YES* we had sound, it was such a great moment to think that I had made this.

You may think that I am being bit silly as to how excited I was and so was Sharon ZL2BQ, but to be able to build something from a few bits and bobs so to speak and then turn it on and get music that you can listen to out of it. That was amazing, well I think it was anyway.

I am now looking forward to finishing the rest of this build, as we ran out of time as we were a bit slow but we hung in there and got the first stage finished. Now I want to venture into building something else in the near future.

I would like to thank Rory and Kelvin for their patience and help during this time we had building the radio.We were a bit slow on the build but never mind we got stage one completed. Now we have to twist the arms of the husbands to supervise the next stage.

If you are keen to get this sort of thing going within your own club, both Kelvin and Rory are the men to talk to. This is not only the way to start your up and coming amateur radio operators, but also to get some of us older ones interested in building radios or other things. Kelvin and Rory are only to willing to help and give you support to get this up and running .Don't hesitate to contact them, as I think it would be a great club project for all clubs to take on board.

Thank you to you both it was fun, interesting and most of all constructive hands on, and it has inspired both Sharon and myself to venture out and try something else to build. Keep up the good work both of you.

Thanks also to Tait Electronics who sponsored this workshop for conference in Nelson. βi

Topsy Scott ZL2LS

Figure 16. PCB mount antennas.

of expensive equipment, including a network analyser.

An improperly designed loop will have a high SWR at the desired frequency, which can introduce instability. For these reasons loops are generally confined to low-cost transmitter devices, such as garage door openers, car alarms, etc.

The company offers several low-cost planar and chip antenna alternatives to the often-problematic 'printed' antenna. These tiny antennas mount directly to a product's PCB and provide good performance for their compact size.

Some designers attempt to attenuate fundamental output power by shortening or lengthening the antenna to shift its point of resonant efficiency away from the fundamental.

This is not usually a good idea for two reasons.

First, by raising the SWR and reducing an antenna's efficiency at your intended fundamental frequency you have potentially increased the output efficiency at a harmonic.

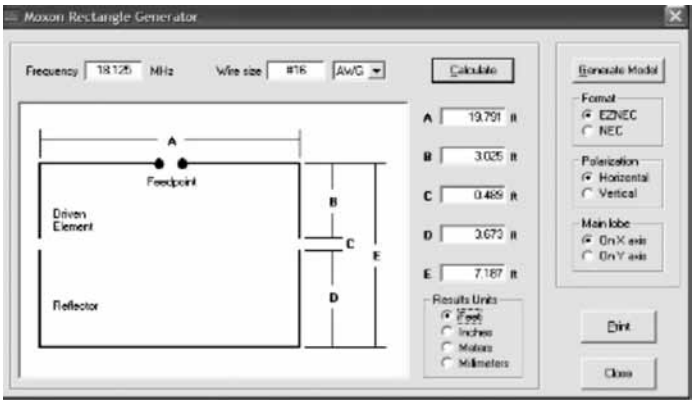
Second, by creating such a mismatch the RF stage may become unstable. Some Linx products allow power levels to be adjusted via programming or an external resistor. In other cases an attenuation T-pad should be used.

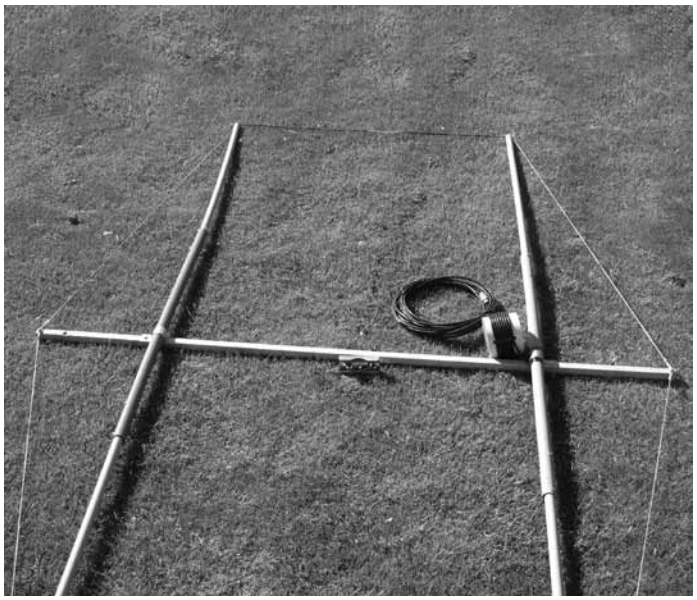
Finally, in the design process the antenna should be viewed as a critical component in system performance. βi

A 6 metre Moxon Portable Antenna

by Paul Ormandy ZL4PW

A mate of mine, Denis ZL4DB, works in some wonderful places. He has been to Macquarie Island twice and is very likely to be working from another sought-after entity or IOTA at some time. Therefore I built him a 6 m band Moxon portable to take with him in the hope that the band opens up and he can offer a "new one" to the deserving.





The first thing to do is to visit the Moxon Antenna Project website and download the Moxgen program to obtain the necessary dimensions. Below is the results based on a Moxon for 50.11 MHz using 2.5 mm wire.

I used old bits I had laying around. But any of the following can be replaced with what ever you have available to do the job. Only the dimensions are critical.

Construction

1 Cut the wires as per Moxgen as exactly as possible; a single piece (dimensions A + D + D) for the ref ector and two short pieces (dimensions A + B + B) which make the driven element.
2 Solder the driven element wires directly onto the end of the coax, one on the centre conductor and one on the screen and tape them up well.
3 Prepare the driven element inner by marking the exact half way point (i.e. 400 mm from the ends) and drill a 6 mm hole 15 mm either side (30mm apart). Slide the wires/coax assembly into the holes and out through the ends. Mark the halfway point on the ref ector element inner and thread the ref ector wire through it leaving approx half hanging out each end.
4 Prepare the 4 x outers. One end will be the tip through which the wire will pass. The other end will

slide into the inner. Drill a 4 mm hole through one wall on the tip to which the braid will attach later.

5 Prepare the boom. Mark the exact centre of the boom and fit the V-block clamp.

6 Determine the exact spacing between the two elements (dimension E), using the boom centre mark as a guide. Drill a pilot hole for two of the self-tappers about 15mm from the ends of the boom.

7 Place a conduit saddle over the exact centre of the inners and line up the inside edge of the conduits with your element spacing marks. Drill pilot holes and attach the saddles/conduits to the boom. Make sure that on the driven element inner, you place the coax feed point in between the boom and the saddle as per the photo below.

8 Use the Moxgen design to calculate how much of the outer should protrude out the ends of the inner (dimension A – 800 mm divided by 2). Thread the wires through the outers and slide the latter about inside the inners to the correct length and as a temporary measure, tape the inner and outer together.

9 With the antenna on the ground, use pegs/rods/screwdrivers pushed into the ground to hold the outer tips in place. Then measure the distance between the pegs to match the Moxgen calcs. Adjust the position of the pegs to suit.

10 Crimp a 4 mm sleeve halfway on to each of the wires, then use the Moxgen calculations (dimension C) and cut two nylon joiners to length and crimp them into the other half of the crimp sleeves.

11 Place the loops of the braids around the self tappers on the ends of the boom and thread through the hole in the outer tips. Make sure the arms are straight then pull tight and tie in place. This should take any slack out of the wires.

12 Wrap approx 6 turns of coax around the 90 mm former as a coax choke to prevent common mode RFI from radiating on the coax shield. Use cable ties to hold the turns in place.

13 Once all adjustments are made, test the antenna for SWR. If all works satisfactorily, drill pilots and use 2 x self tappers in the end of each inner to hold the outers in place, and remove the temporary tape.

The Moxon portable is now ready for the next DXped! βi

References

<http://www.moxonantennaproject.com/>
<http://www.moxonantennaproject.com/design.htm>

Parts List
10 x #8 12 mm self-tapp screws
2 x 25 mm galvanised half-saddles
2 x 800 mm 25 mm PVC conduit “inners”
4 x 800 mm 20 mm PVC conduit “outers”
1 x 20 x 20 mm aluminium square tube
4 x 1.5m 2 mm fishing braid or strong UV resistant cord
4 x 4 mm tinned copper crimp sleeves
200 mm x 2.0 mm nylon/weedeater line
90 mm dia x 120 mm PVC pipe
50 Ohm coax cable
4 x 200 mm black UV resistant cable ties
1 x Vee-block clamp assembly
1 x roll insulation tape
4 x pegs (see text)

NZART Officer Vacancy

NZART Council is calling for expressions of interest from NZART members for the following Officer Vacancy. NZART is a body that promotes Amateur Radio within New Zealand.

Position: NZART VHF/UHF/SHF Records Coordinator

The NZART VHF/UHF/SHF Records Coordinator is appointed by NZART Council to coordinate and to promote, the keeping of accurate records pertaining to performance of VHF/UHF/SHF activities and operating by NZ amateurs. Although referred to by VHF/UHF/SHF, the task may extend to other bands.

The NZART VHF/UHF/SHF Records Coordinator reports to NZART Council through an appointed Liaison Councillor.

Duties of the position:

- To maintain, review and update when necessary, the established:
- VHF/UHF/SHF Records Lists,
- the VHF/UHF/SHF Record Claim Rules, and
- the Record Claim Form.
- To receive completed Record Claim Forms submitted by radio amateurs, appropriately process to verify by making whatever enquiries may be necessary, and make the concluding decision to accept or to reject the claim.
- To amend the Records lists as appropriate.
- To promote active operating for records achievement among New Zealand amateurs.
- To arrange for presentation trophies and certificates relating to Records.
- To appoint assistants as necessary.
- To provide advice and guidance on Records issues.
- To liaise with overseas radio amateurs and other amateur societies on Records matters.
- To write occasional entries for *Break-In* about Records.
- At time of dispute, to refer incidents involving Records Claims and the Rules to NZART Council.

Work Experience; The NZART VHF/UHF/SHF Records Coordinator will be expected to demonstrate competent performance in:

- Maintaining accurate and detailed records.
- Good written language skills for communication with members, overseas societies, and articles for publication.
- The accurate measurement of distances and global positions, recognise and understand the errors possible in GPS reports, in the selection of map series and in grid references.
- A good working knowledge of all the measurement and technical terms listed on the Claim Form.

Personal Skills. The NZART VHF/UHF/SHF Records Coordinator will require:

- Good person skills.
- An understanding of the requirements and issues involved in Amateur Radio hill-top activity including possible interference to other radio services.
- A good knowledge of Amateur Radio and the aims of IARU and NZART.
- Competency in spread sheet and word processor applications and with any specialised software appropriate to the position.

Applicants for this role can be located anywhere in New Zealand. The ideal person for this role would have experience in the area of VHF/UHF/SHF operating and/or contesting.

Officer Positions are voluntary; however operating expenses will be refunded as per the NZART Policy on Officer's Expenses.

Applications for this position will be accepted from interested persons in writing with supporting documentation through the General Secretary, NZART, PO Box 40 525, Upper Hutt 5140.

This advertisement is authorised by NZART Council; June 2012

Longer Wavelengths

Con Wassilieff ZL2AFP
<zl2afp@nzart.org.nz>

600 m net

The Thursday evening 600m net meets weekly, with the co-ordination net on 3666 kHz starting at 8.30pm. Recent 600m transmitting stations have included ZL1QM, ZL1BPU (running QRP), ZL2T, ZL3EE, and ZL4MD. Propagation conditions on 600 m continue to be variable.

Germans first on the new 472-479 kHz allocation

The title says it all. In respect of the ZL situation, Don Wallace ZL2TLL, the NZART Administration Liaison Officer, writes:

"While it is clear that I should be asking the MED for us to have access to the new allocation (of 472-479 kHz), a number of details need to be sorted out such as:

- How hard should we fight to retain the existing (25 W eirp) power limit rather than the ITU 5 W eirp limit?
- Should we seek to retain part or all of our existing (505 – 515 kHz) temporary allocation?
- Should we be seeking a special exemption for Musick Point's two frequencies?

I would like to get the views of LF enthusiasts and/or experts people like yourselves on these and related questions."

So, if anyone has ideas on these topics, please drop a line to Don at <nzart@wallace.gen.nz>. My personal view is that I believe the power limit of 5W was a compromise to suit countries with less-than-favourable attitudes towards amateur radio. We could argue that we are so far away from the rest of the world that we need all the power we can muster to achieve contacts with overseas stations so we should ask to retain our 25 W limit, and also the current 600 m allocation as it is. It would be nice to have the 200 Hz bandwidth restriction on transmissions increased though. Although it is not such a big issue at the moment (as most contacts are on narrow band modes anyway) it does restrict experimentation.

Redifon NBD transmitter

I am the recipient of a Non-Directional Beacon transmitter (NDB), courtesy of Colin ZL2CMC. It is currently non-functional, and I am refurbishing it for use on our 600 m band (and soon-to-be allocated 472-479 kHz band). It is a Redifon Solid State Beacon model BK125,

Figure 1. Redifon BK125 NDB

built in 1975 and I understand was used in Gisborne. It is an amplitude modulated transmitter, sending MCW as an audio tone at either 400 Hz or 1020 Hz, so is not directly usable on our 600 m band, where a signal bandwidth of only 200 Hz is allowed and a continuous carrier with superimposed 400 Hz MCW exceeds this restriction.

The BK125 uses bipolar transistors which are more prone to failure than MOSFET's used for the same application. As a bipolar transistor heats up, the current increases, as opposed to MOSFET's where the opposite occurs. MOSFET's are more tolerant of disaster. Accordingly, the BK125 has a plethora of protection circuits designed to ensure the bipolar transistors are protected against changes in load, drive failure etc. thereby to ensure reliable operation unattended, and this complicates the circuitry considerably.

Restoration of the beacon to original condition is hampered by the modulator driver boards being in poor shape, with many missing and some badly corroded components. Most of the protection mechanisms rely upon the modulator driver circuits and so most of the protection circuits will not be able to be operative. This is not a serious drawback as the refurbished transmitter will not be used unattended and so an eye can be kept on things. One protection circuit remains though; the "overlap" detector, which is independent of the modulator driver. But more of this later.

The BK125 operates in the frequency range 200-600 kHz, with a maximum carrier output power of 125 watts. Keyed tone amplitude modulation is applied to the power amplifier (PA) stages by a Class-D modulator. A pulse width modulated (PWM) signal is generated in the Modulator Driver board (which is defunct), by a ramp generator at

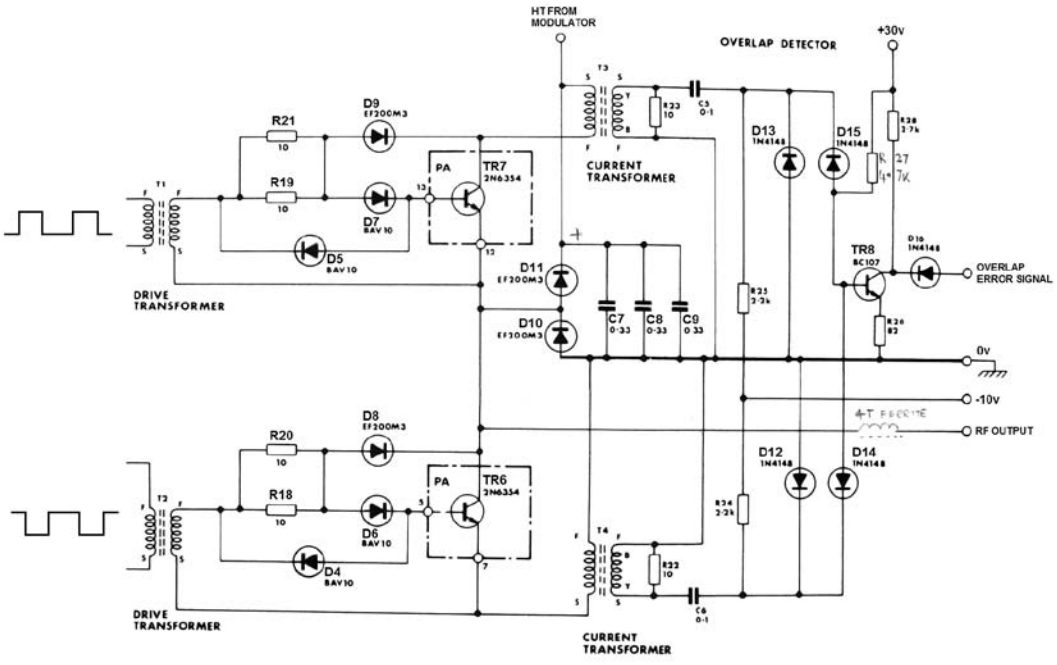


Figure 2. PA circuit with overlap detector (adapted from BK125 manual).

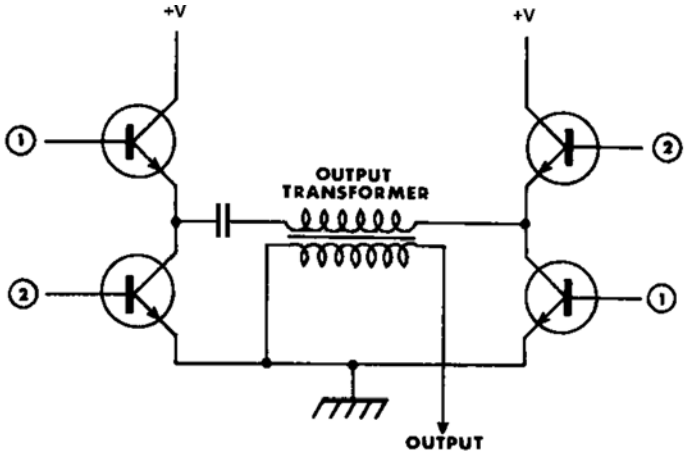


Figure 3. Full bridge topology (adapted from BK125 manual).

17 kHz which drives a comparator also fed with the audio signal (the modulation) and a DC level (which controls the power level). The output of the comparator is a PWM signal which drives the modulator power switch (a Darlington pair transistor). In effect this is a switch-mode voltage regulator.

A low pass filter between the modulator output and the supply of the RF PA stage removes the unwanted 17 kHz component and leaves a high power sinusoidal audio signal. There is also a DC component in this signal which is the average supply for the RF PA stage. The audio frequency swing superimposed on this DC provides conventional high power amplitude modulation of the PA.

Figure 2 is a portion of the PA schematic showing the final stage. The two PA transistors (2N6354) are arranged in series in a totem-pole (half bridge) configuration with the square wave drive switching each transistor on and off alternately. RF output is taken from the middle of the two transistors, where the output is a square wave that switches approximately between 0 V and 140 V (the supply voltage).

Note that the upper PA transistor TR7 is on the "hot" side, so its drive is isolated by the drive transformer. To ensure the drive is identical and the delays the same, an identical driver and transformer is used on the lower transistor.

Looking at the PA transistor drive network (e.g. the lower one, after T2), R18 and R20 limit the base drive, and they also perform the important function of controlling the load on the driver when D8 conducts. D6 and D8 work to prevent PA transistor TR6 from saturating when its turned on. When it goes on because of the drive current in the base, the collector drops until D8 conducts, which shunts the drive away from the base. This will be when the collector reaches about the base voltage (equal drops across D6 and D8). Without D8, the transistor would saturate (collector goes below base voltage), filling the junction with lots of charge, and recovery on switch-off would be very slow.

Overlap protection circuit

The PA drive duty cycle must be exactly 50%, and care must be taken that the upper and lower transistors are not switched on at the same time, as this will create a short circuit from HT to ground. Although the diodes in the base circuit of each of the final transistors help top switch the drive on and off quickly, there will still be some charge remaining on one base while the other one is being turned on.

To this end, the BK125 utilises a novel circuit to ensure the two transistors cannot both be in conduction simultaneously. The two current transformers in figure 2 monitor the current and the "overlap detector" senses when both transistors are on at the same time and sends a correcting voltage back to the signal generator to reduce the pulse duty cycle to ensure that one transistor is completely turned off before the other one is turned on. No voltage develops across D12 (or D13) during negative half cycles of RF, but positive voltage is developed across the diode during positive half cycles. If both D12 and D13 raise voltages, both D14 and D15 cease to conduct and hence transistor TR8 conducts and sends a signal of the appropriate polarity back to a monostable in the RF signal generator. The -10 volt supply provides bias to enable the detector to operate correctly, otherwise it will always be on. The -10 volt supply is also used for PA driver bias. Another complication of this particular circuit design.

The two halves of the overlap detector also protect against fault conditions such as a short to ground or HT (or failure of one of the PA transistors).

Spike protection

There are two identical modulator and PA stages, with the PA outputs combined in opposite phase in a full bridge circuit. Most high power commercial transmitters have final PA stages that operate as a full bridge.

The output transformer combines the outputs of each of the two separate PA stages using a ferrite core transformer. There will be series leakage inductance not seen by the load, which will cause narrow spikes on the output, which could cause the transistors to fail as the spikes could take the collector up to many times the supply rail voltage. These spikes are conducted into the HT supply or ground by the diodes D10 and D11 operating as f yback diodes. The three capacitors C7, C8 and C9, form the RF bypass for the HT supply and the output capacitance of the modulator filter. They carry lots of high frequency current.

Modifications

I am retaining only the RF signal generator and the PA stages, as everything else is redundant for my purposes. Figure 4 is a fair representation of what it will look like. The crystal oscillator will be replaced by a variable frequency source. All IC's are TTL and the SN7410 oscillator works fine with a sinusoidal input of around 0.5 V or so directly into the crystal socket. This allows a very easy transition to FSK modes. It remains to be seen if the PA stages still work but I hope to have it all going by the next column.

Erratum

In the last column there was an error in figure 3 ("A simple LMS filter"). The two formulae in the box should not be identical. The lower one should read C2 = C2 – Input(2).u.e. It is not a very good filter otherwise!

References

Redifon Technical Manual – Maintenance manual for 125W solid state beacon transmitter Type BK125 Volume 1 of 2, Redifon Telecommunications Limited, 1975.

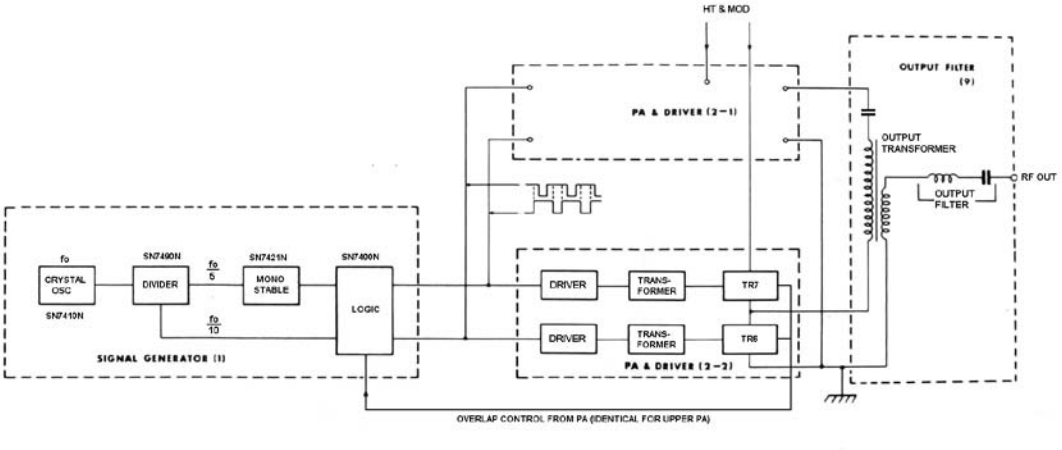


Figure 4. Block diagram of essential elements.

The Morseman

Gary Bold ZL1AN
<morseman@nzart.org.nz>

The Marconi Valve Receiver.

In the last column, I queried the "Fleming valve receiver" which several references state was installed in the Titanic's radio room. George ZL2AG sent the schematic shown in figure 1, which comes from a 1914 textbook, downloadable from the web[1].

As typical for the time, the schematic is drawn to make it fit the page better. If you untangle it, you'll find that a high-pass L-section tuner (ATC) feeds an adjustable, mutual-inductance coupled filter in series with the twin-diode rectifying section and ear-phones, very like a crystal-set circuit. The filter can be switched out (the DPDT switch at bottom) to widen the bandwidth for general listening.

Ron, ZL1AI, unearthed the first valve and receiver patent[2], filed by Fleming in 1905, which says "… the filament should be of carbon… such as is used in any ordinary incandescent lamp…taking a current of six to eight volts and two to four amperes." It also shows schematics of radio receivers using both half and full-wave rectifying circuits, and one where three diodes are connected in parallel "to produce greater current". The indicator element is a mirror galvanometer, a device having a long time constant quite unsuited to Morse reception. Presumably earphones, as used in the Marconi Titanic receiver, came later.

Why are there two diodes in the valve receiver, only one of which is selectable at a time? The author's brief, and somewhat opaque description doesn't say. Barry ZL1DD (now resident on Thailand) is an expert on ancient valve gear, so I queried him. He says:

"Valves of the time were not high vacuum, they were "gassy" or "soft" and presumably careful adjustment of the filament voltage was required to get them on to a good diode curve. I think there would have been wide spread of characteristics, and valves might have been unstable over time, hence a choice was given between two. Also it's possible that filaments were not strong, and could blow. I have no idea about the battery voltage. The material used for the filament would be an important factor.

"The variable coupling devices are almost certainly "variometers", one coil rotating inside another to give series adding or subtracting to vary inductance. This was a popular technology for lower frequency work until recent times, more popular in Europe than in UK/US later. German and Russian HF amps often used a variometer plus a fixed capacitor for tuning final amps.

"Lore has it that the "maggie" (magnetic detector) was more reliable than other detectors in early days. When galena crystal detectors arrived there were many mechanical arrangements, and ops would carry a favourite lump of galena with them from one assignment to another."

The First Triode

Fleming's valve was only a diode. The first triode-like device was patented in 1908 by Lee De Forest, and the patent diagram[3] shows his three-element "Audion" connected in a receiver, with earphone. His description states:

"I have determined experimentally that the presence of the conducting member, which as before stated may be grid-shaped, increases the sensitiveness of the oscillation detector and, inasmuch as the explanation of this phenomenon is exceedingly complex and at best would be merely tentative; I do not deem it necessary herein to enter into a detailed statement of what I believe to be the explanation."

Like the inventors of the first transistor, he discovered the amplifying action by accident, and his circumlocutory words above imply that he had no idea how it worked. I've described the Audion as "triode-like", because De Forest thought that a low-pressure gas atmosphere was necessary for its operation. For technical reasons, while this produced an "amplifying detector", it couldn't be used as a linear amplifier. However, one reference states that he did produce a telephone-repeater amplifier having two triodes in series, in 1912, implying that he'd circumvented this limitation. Confusing.

The correct explanation of modern triode operation was published much later, in 1913, by Irving Langmuir. He realised that a "hard vacuum" was necessary for amplifying operation, and developed a better method of bulb evacuation which made it possible. His paper advanced the "space-charge" effect and derived the famous triode "three-halves power law". The modern triode amplifier resulted.

Why wasn't De Forest's more advanced Audion valve receiver, which amplified the signal, used on the Titanic? The literature is unclear, but it seems that there was initially considerable distrust and confusion about the his Audion, as nobody else could really explain how it worked either, and individual samples not only varied considerably in their characteristics, but also degraded with use. Also, Marconi was very conservative. He insisted that only approved Marconi equipment could be used in his ship installations, no modifications to it were permitted, and operators must be employees of his company. Fleming had worked for him before, designing his first trans-Atlantic transmitter (see my May/June 2011 column) and was an engineer that Marconi trusted. But De Forest worked independently, and Marconi's conservative nature probably disinclined him to use such a new, and relatively unproven technology.

The only video footage I can find of Marconi is in a You-tube clip.[4] If you find others, let me know?

The Arc Transmitter

While this was going on, a different technology was developing. This is unusual, because it resulted in wide-spread use in two completely different areas - lighting, and wireless transmission. Humphry Davy, around 1805, had connected a 2000-cell battery in series with two charcoal sticks, and found a dazzling light was generated by current passing between them when placed 10 cm apart, enough to exceed the air's breakdown voltage. The convective upwards airf ow forced the discharge into the shape of an arch, which was contracted to "arc" when it was later used in "arc lamps". By the 1880's, these were in wide use for street lighting all over the USA.

But these lamps often made disconcerting noises, humming, hissing, or even "howling". William Duddell, a student at a London Technical College, was tasked to investigate this as a research problem in 1899. He determined that the arc's volt-amp characteristic had a negative-resistance region, making it operate as an audio relaxation oscillator, which could be tuned by placing reactive components in its power leads.

In 1903, Valdemar Poulsen experimented with different geometries and smaller reactive components in an atmosphere of Hydrogen, and succeeded in producing stable oscillations above the audio range, up to about 1.1 MHz. His first paper, though obscure in parts, is still worth reading.[5]

He immediately realised that Rf transmitters using an arc would be advantageous for two reasons: Firstly, they would be more efficient than spark transmitters, since the discontinous nature of spark transmissions reduced their average power, and secondly, the continuous

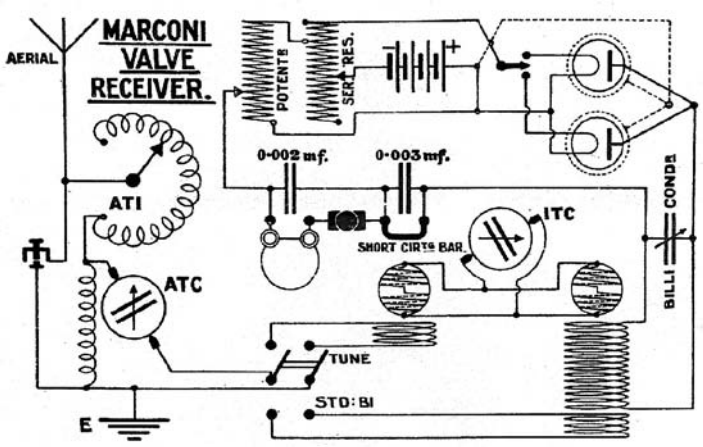


Figure 1. The Fleming valve receiver.

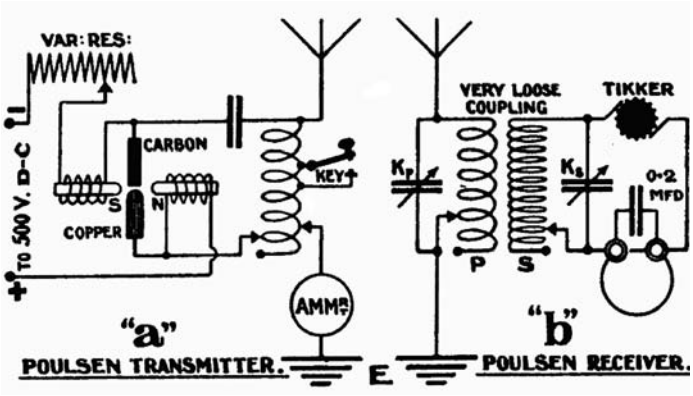


Figure 2. The Poulsen Morse transmitter-receiver system.

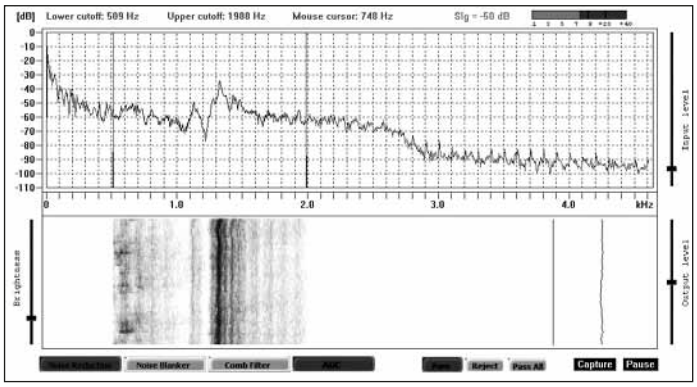


Figure 3. ZL2APF's adaptive audio filter.

waves, or "CW" produced by the arc would have a much narrower bandwidth, so more stations could operate in a given spectral region. Figure 2 shows diagrams of the Poulsen Morse transmitter-receiver system which had evolved by 1910. The arc is formed between copper and carbon electrodes in hydrogen. It was found experimentally that the arc was most stable when in a strong magnetic field, as shown. When this diagram was published, several such arc transmitters said to be radiating at around 100 kW were operating.

But this generation method brought two problems: Firstly, the arc took some time to strike and adjust for stability, so could not be on/off keyed like a spark system. The solution was to use (for the first time) frequency-shift keying. In figure 2(a), the key is shown shorting a small segment of the transmitter coil, increasing the oscillation frequency by 1 - 2%. And of course this necessitated a narrow-bandwidth receiver, since the "key-up" frequency had to be outside the passband. The second problem was in the receiver.

The Poulsen Receiver

See figure 2(b). This looks much like a crystal set, except that the crystal is replaced by a curious object called the "Tikker". Spark transmitters produced a modulated hiss, buzz or (for synchonous systems) musical note, but a detected arc CW waveform produced only silence; except for key clicks and a slight hiss from arc irregularities. The "Tikker" was invented by Poulsen and Pedersen in 1908 as a form of mechanical BFO.

A metal toothed wheel rotated at a constant speed. A light wire rested on it. As each tooth ran past the wire, ohmic contact between them was regularly made and broken, typically 1000 times per second. Since this was in series with the headphones, it "chopped", or modulated the detected carrier at this frequency, giving an audible note.

Arc systems were in widespread use for about 10 years, eventually superseded by vacuum tubes. Some of them were enormous. You can find images on the web.

The Arc Movie projector

The other use of the carbon arc was as an intense, concentrated light source. Arc lamps were the main light source for motion picture projectors for over 40 years. I'll comment further on such projectors in a later column, but in the meantime, you can see an excellent descriptive video on You-tube.[6]

The Q Code

Stuart, ZL2AAC, sent this: "A small point re the Q-code you mentioned in the last column: First, you didn't say why it was called the Q-code. Well, there are always three letters, the first is Q, and the second is R, S, or T, which immediately puts the recipient on the alert for a 3-letter Q-code, because in English Q is always followed by U (Qantas isn't English!).

"I recall that many decades ago some idiot published a 3-letter Q code beginning QU, not realising that defeated its own object. I've never come across it since – have you? I like to think it died the death it deserved."

A Free Adaptive Software Audio Filter

In the last two issues of *Break-In*, Con ZL2AFP, has described a software audio filter, called "APFfilter", which implements the LMS (least mean squares) adaptive algorithm invented by Bernie Widrow and his PhD student Ted Hoff at Stanford University in 1980. It's very simple to implement, but very complex to derive, as brave readers can see from the Wikipedia article[7].

But it's easy to use. Figure 3 shows a doctored screen grab of the operating window – doctored because the original has a black background, with delicate white graticule which wouldn't reproduce well, so Con supplied me with this "reversed colour" version, and has allowed me to place a downloadable, zipped version on my website[8].

The passband is set by moving the two vertical cursors in the top pane spectrum display with the mouse. The bottom pane shows a moving, intensity-modulated waterfall. Pressing the bottom left-hand "Noise Reduction" (which you can't read here) button starts the LMS algorithm.

This begins operating on the information in the selected passband, rapidly modifying the software-defined filter characteristic to reduce the noise – which it can perceive because it's statistically random - and leaving coherent signals largely unchanged.

This can be sometimes quite effective in pulling a CW signal out of the noise, as long as the CW is not too fast, when it also becomes "noise-like". As well as this, Con has implemented a selection of notch filters, with stop-bands which can be placed over interfering signals or heterodynes. All the filter edges are very sharp, since they're formed with FFT methods. This is quite a trick, and I know of no other free software that does it.

There's also a comb filter, which removes 50 (or 60) Hz and its harmonics, a noise blanker (which doesn't work well for me) and options to capture the window to a graphics file, switch in automatic AGC with fast or slow time constants, change the sampling rate and adjust the computer's audio controls.

To run it, get and unzip the software, connect the audio output of your receiver to the sound-card input on your computer, and adjust the gain to set the signal at a suitable level. There's a help-file, which I wrote, which tells you basic things without getting involved in mathematical details. Let me know what you think of it?

Last Month's Problem

The goof in the circuit of the Powerless modulator circuit was spotted by Doug, ZL2TAR, Ross ZL3TFK, Bob VE7BS, Alastair ZL2ARC, Graeme ZL1ANH, Ron ZL1AI, Jack ZL4QN, Dick ZL2TGQ, Gary ZL2TBH, John ZL1BDY, Graham ZL3GSL, Basil ZL1TOW, John ZL4IM. The plate and grid are drawn connected together!

Bob, VE7BS, wrote: "Hi Gary. Looking at the "problem" of the plate/grid short of the 6Y6G I thought "I must have a problem (serious cerebral atrophy) if I missed that!".

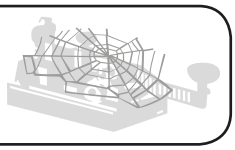
"This 'powerless modulator' is close to the circuit that is responsible for my ownership of the suffix BS. On arrival in VE7 from the UK in 1953, the first thing I did was walk around to the Dept of Communications office and enquire about getting my Canadian ham radio licence. The Radio Inspector checked my Morse and handed me a technical exam paper. The first question was draw a simple amplitude modulated Tx complete with power supply. I sketched out an oscillator and PA, and then said: "Can I do any kind of modulator? I guess Clamp Modulation would be easiest."

He said "That's not a particularly

continued on page 16

Silent Keys

The Association deeply regrets to record the death of the following members and extends its sympathy to the bereaved.



Silent Keys: guidelines to contributors

Contributors are requested to limit their obituaries to between 200-400 words. Content should focus mainly on the amateur radio activities of the deceased. Normally photographs cannot be included.

Richard L Baldwin W1RU
NZART Life Member

It is with regret to report that Dick Baldwin W1RU, past IARU President and NZART Life Member, died on 21 June, aged 92. As ARRL Assistant General Manager Dick was the ARRL staff member who was primarily responsible for initiating preparations for the 1979 World Administrative Radio Conference and was one of the key players in formulating the objective to obtain new amateur HF bands at 10, 18 and 24 MHz. As ARRL General Manager from 1975 to 1982 he played an essential role in turning that objective into reality. Following his retirement from the ARRL staff Dick was elected President of the IARU. He had served as IARU Secretary from 1976 to 1982. He served as IARU President for 17 years, which included managing the transition to a new IARU Constitution that made the IARU a more representative body. Upon his retirement from that volunteer position in 1999 he was named President Emeritus by the IARU Administrative Council. Dick initiated and led Amateur Radio Administration Courses to appraise the administrators of amateur radio in many countries of the benefits and advantages for developing a viable, healthy and active, amateur radio service in their countries. Dick's thorough preparatory work and leadership set the basis for the very successful review of the Amateur Service at the World Radio Conference 2003. A great friend and supporter of amateurs and amateur radio societies the world over, Dick was made a Life Member of NZART in 1992 to recognise his service and achievements for the world Amateur Radio fraternity.

continued from page 15

good method." I said "I've just published an article *'In Defence of Clamp Modulation'* in a British magazine!" He said "You wrote that? Throw away the paper – I'll see if I can find a two letter call…how about VE7BS?" I sounded out 7BS, nice and rhythmical, and said "Fine." He also called a local company and got me an interview which led to my first VE7 job. I then went to get my luggage out of the baggage depot at the railway station.

So I have reason to have a nostalgic respect for "powerless modulator", "clamp modulator" or whatever.

This Month's Problem

Figure 4 shows a transistor amplifier which gives a controllable voltage gain with input impedance higher than that of a standard common emitter stage. The voltage measured across R_1 is 1V, and V_{be} is 0.7V.

What is the DC voltage at the collector of the transistor? What is the predicted AC voltage gain, Av = V_2/V_1? What is the quiescent base current? What is the advantage of biasing the transistor with a resistor from collector to base? Can you estimate the AC input resistance?

References

[1] A Text-book on Wireless Telegraphy, Rupert Stanley, see <http://archive.org/details/textbookonwirel04stangoog>

[2] Fleming valve patent <http://www.andycowley.com/valves/old/history/fleming.html>

[3] Lee De Forest Audion patent <http://www.google.com/patents?vid=879532>

[4] Marconi Video <http://www.youtube.com/watch?v=HxUPXUijuT4&feature=related>

[5] Poulsen arc paper. <http://earlyradiohistory.us/1904pou.htm>

[6] Carbon arc projector. <http://www.youtube.com/watch?v=0iSclfqfCGk&feature=related>

[7] Adaptive LMS filter. <http://en.wikipedia.org/wiki/Least_mean_squares_filter>

[8] Download the LMS filter from <http://www.qsl.net/zl1an/index.html>

IARU – International Amateur Radio Union

IARU Liasion Officer: John Lochhead ZL4QS
Liasion: Terry Carrell ZL3QL, Don Wallace ZL2TLL, Fred Johnson ZL2AMJ, Terry Thomas ZL4TAE, Stephen Hayman ZL1TPH, Edwin Musto ZL1BBO

Greetings from a cold Central Otago. The winter this year has been fairly harsh with ice frozen on parts of Lake Wakitipu and curling in full swing on the Ida Burn Dam.

Preparation of quality papers for the 15 IARU Region 3 Conference in Ho Chi Min City 5 to 9 November 2012, is, at the time of writing, nearing completion. The theme of this conference is Emergency Communications. All papers are being submitted to Council for approval as official NZART contributions.

Papers include

- Report from NZART
- New Zealand Band Plans; update from FMTAG
- The IARU Region 3 Award; update from Alan Chapman, ZL3GX
- KiwiSAT; update from AMSAT-ZL
- Christchurch AREC Earthquake Response. Paper by Richard Smart ZL4FZ/ZK9EA
- NZ & International Emergency Communication.
- IARU Region 3 Finance review.
- Economies in Future IARU Region 3 Conferences.

The NZART team to attend the conference will be: John Lochhead ZL4QS (Delegate), Don Wallace ZL2TLL (observer), Terry Carrell ZL3QL (observer). All are working to maximize the NZART contribution to this vital conference. This is NZART's opportunity to contribute to and inf uence the destiny of amateur radio both in New Zealand and internationally.

The finances of Region 3 were addressed at the 14th Triennial Conference held in Christchurch in 2009. After in-depth investigation by the Directors this topic returns to agenda for further discussion. Over the last 3 years the Directors of the Region have had serious discussions as to the direction the Region should take and this conference will be NZART's opportunity to inf uence changes that our society feels are appropriate.

At the NZART Conference held in Nelson this year, the Liaison committee was formalized as below

Chairman; ex-officio
Vaughan Henderson ZL1TGC President
IARU Liaison Officer
John Lochhead ZL4QS
Assistant
Terry Carrell ZL3QL
NZART ALO
Don Wallace ZL2TLL
Members
Fred Johnson ZL2AMJ, Terry Thomas ZL4TAE, Stephen Hayman ZL1TPH.
Plus FMTAG Chairman ZL2SX.
Disaster Comms ZL1DK
IARU REGION 3 Disaster Communications Committee

Peter Lake, ZL2AZ, a Director IARU Region 3, maintains close liaison with the committee. His advice is of enormous value. Planning for continuity of the committee is a constant consideration and it is with pleasure that we welcome Edwin Musto ZL1BBO. Edwin brings experience in Region 1 and 2. His knowledge will be of benefit to the work of the committee.

John Lochhead ZL4QS

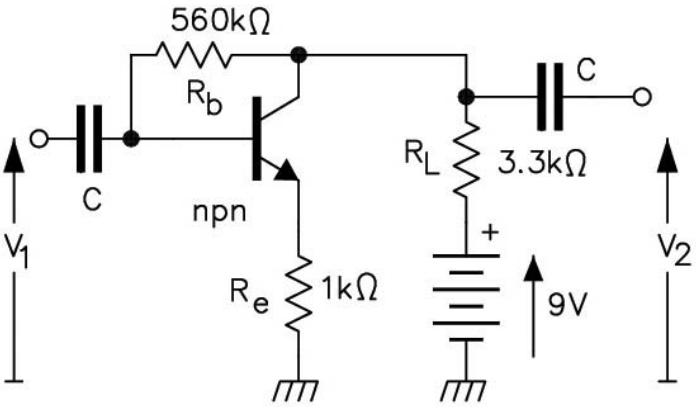


Figure 4. Transistor amplifier circuit for this month's problem.

The LogiTALKER voice keyer

by Andrew Barron ZL3DW

Call me lazy, but when I call CQ on SSB I tend to give up fairly quickly if the band is quiet and I don't get a response after three or four calls. I also love to work contests but being a 100 W station, I usually work in the "search and pounce" mode working up and down the bands working the big gun contest stations and hoping for a rare DX contact. Nearly all of the big contest stations use voice keyers because operating for hours at a time can really hurt your voice. In fact a lot of the latest 'elite' class transceivers used by the serious contesters have voice keyers built in. A few stations run their keyers on such short repeat times or in QSK mode that they can't hear you come back to their call which is exceptionally frustrating. Anyway in spite of a few contest 'Lids' I was keen to get a voice keyer too, so that I could call CQ in contests and on those quiet bands.

I tried a couple of software based voice keyer programs like GCVoice Keyer (Freeware) which sends pre-recorded audio files stored on your PC over the same rig interface as used for digital modes like PSK and RTTY, but my rig never modulated properly, the audio was thin and it meant running another program at the same time as the contest logging program. It is worth a try, since the software is free, but I was never happy with the results. I never attempted to use GCVoice keyer in a contest. So then I looked at hardware voice keyers and it seems that the main contenders are the LogiTALKER from Idiom Press <http://www.idiompress.com/logitalker.php> and the MFJ-434B from MFJ. Of the two the LogiTALKER is cheaper and has much better reviews <http://www.eham.net/reviews/detail/8980>, so I ordered one, (more on that later).

The unit is a stand-alone voice keyer that goes between your microphone and your radio. It uses your regular microphone to record up to four messages, to be played back at the touch of a button. It's a simple, easy-to-use, way to save your voice in a contest! One message can be set to auto-repeat, which is perfect for "running CQ" contest stations, or for calling CQ automatically as a band opens. You can record two 16 second messages with a sampling rate of 8 kHz or four 10 second messages with a sampling rate of 6.4 kHz.

It works with just about any microphone, dynamic or condenser, which has an eight-pin round plug or an eight-pin modular plug. It can be reconfigured for a different brand of radio by reconfiguring jumpers, so your LogiTALKER isn't tied to just one radio. You do need to buy or make a cable to go from the box to the radio. The price for the keyer is US$120 as a kit, or US$150 assembled and tested. I went for the fully assembled version and paid a bit extra for the cable but the reviews say the kit is easy to assemble and no major problems were experienced apart from one ham reporting that an incorrect value resistor had been supplied. The price of the cable was $17.95 but that is mostly due to the expensive 8 pin connector. The price for the MCM cable used in FT-897 and other modern radios is only $4.

The LogiTALKER was invented by Allen Baker KG4JJH <http://www.kg4jjh.com/>, who wanted a compact and simple device to save his voice in contests. The result was his design that he called the Vocal Keyer <http://www.kg4jjh.com/vocalkeyer.html>, which was featured in an article in the June 2009 issue of *QST*. With the addition of a few features and a custom enclosure, the Vocal Keyer became the LogiTALKER. The keyer is based on an integrated circuit, the HK828, which provides high quality single-chip recording and playback. The HK828 integrates many of the components necessary for a voice keyer, including an oscillator, microphone preamp, automatic gain control, antialiasing filter, smoothing filter, speaker amplifier, and non-volatile memory.

What I like about this product is that it works exactly as promised. I recorded my messages and used the keyer in a recent contest, it was brilliant! Now, I can't imagine calling CQ in a contest pile up without it. It is also very handy when you are trying to work a DXpedition and having trouble breaking through the pile up as well. I just recorded my call-sign and nothing else for memory slot 4. I am sure it would be equally good if you were operating a DXpedition station.

When you first get the unit, you have to set some push on links inside the box to setup the mic connections for your rig. I was lucky because it came already set for my Yaesu FT-897 so I only had to check they were correct. Recording is very easy and it is simple to do it over if you get it wrong. The mic is very sensitive when recording and I had to speak a bit further away than normal, especially as I wanted to make the recording sound urgent the way it sounds during a contest. The unit retains the messages in its non volatile memory with the power off, so I just connected it to the rig power supply. All functions on your mic work completely normally and will stop a message during playback if you push the PTT. The audio quality is pretty close to normal with maybe a little background noise. I had to record the messages with the rig and my PC turned off as you could hear the fan noise on playback. There is a small speaker so you can hear the playback, but is nearly useless and sounds like a strangled cat; I found the best way to hear the real audio is to turn on the monitor function on your rig.

Overall for me this was a great investment and I give the unit an 8 out of 10, it would be a 10 out of 10, except for the difficulty I had in the ordering process. I ordered and paid online using a credit card and immediately received an automatic order confirmation via email. But after almost a month I had no confirmation on shipping from the vendor and no debit on the card so I wondered if something had gone wrong. I emailed the vendor twice to check if they had shipped my order and got no response at all, so I emailed Allen Baker who has no connection to the company but did invent the prototype, and asked if it was still possible to buy that version, but it is no longer available. Allen was very helpful and responded immediately to my two emails and he even emailed the boss at Idiom Press on my behalf. But unfortunately I still got no reply from them. So I ordered again, and again no response from the supplier. Rather discouraged I decided to look at buying the MFJ product or building my own using the same chip which is available elsewhere as a bare board voice recorder kitset. Then about three weeks later I got an email from Rob W7GH at Idiom Press saying that the unit would be available in less than a week and a week later I got one saying it had shipped. There was no charge on my card until it shipped. It duly arrived and is fantastic. I thought I would be nice and email the supplier saying that it had arrived and works great…no reply.

So overall it is a great product for the serious DXer or contester and I am fairly confident you will eventually get one if you order one; but it could take a month or two if they are out of stock. The kitset may ship faster as the holdup with mine may have been in waiting to have it assembled. βi

Next deadline for copy is
10 September 2012

"The Ballad of the Ham"

or "The Grind Around the Beacon!"

By Roger Lusby

As presented at the NZART Conference, Nelson 2012.

Last night I had the strangest dream, I dreamt I was a HAM
Tapping out my message, the way no other can
Twiddling my crystal tags, to get the best reception
I started hearing messages from someone's DX pedition

The information coming in, really was exciting
Well for a HAM it was at least, you see they were inviting
Everyone to take part in the annual competition
To see who was the fastest HAM, the fastest in transmission

There would be fierce challenges from all the HAMs to see
Who would be king of all the world upon the small morse key

The first one up to start to show was Dr Bold of course
He had a reputation as New Zealand's Man of Morse
A trumpeter, a teacher, a musician and a clown
His Belly dance round Birkenhead is somewhat world renown

Ian Ashley, he was there, though high up in the clouds
With satellites and aeroplanes, away from all the crowds
HAM-ing it with Margaret, they are a lovely pair
In their house up in the hills, they thrive on thinner air

Don Ewen lined his morse key up, and firmly took a grip
Upon the task before him, he shot straight from the hip
Never one to pass a dram he reckons he's the boss
In his northern town of Waipu, they call this fella Hoss

David Karrasch, well he lined up, and to ensure his luck
He brought his own supporters on his brand new Hi-Lux truck
A crowd from Takanini they were rearing with a force
So David he just wrote his speech, the winner's one of course

Debby Morgan, here's a girl who knows a thing or two
And keeps the morse key tapping, they say she is the glue
That holds it all together, but will she win the fight ?
There's some who think she won't of course, but some who
think she Might.

Dave Scott, the favourite, a local lad we know
He thinks he's got the answer to winning this year's show
He's been a fiddling with everybody's keys
With the opposition crippled, he will have them on their knees

Now Topsy Scott, the underdog, you know that old expression
She's been broadcasting for years, they say its her obsession
She started up a rumour that has caused a lot of worry
But don't let Topsy rattle you, there's no shit-stirrer's trophy

Now Sharon Millar, she's a NAG, the black horse of the troop
Again a local lass who features often in her group
A winner in the past I'm told, as she will sometimes lose
A word or two to help her speed when tapping out her muse

And last of course, apart from me, Jim Meacham's late decision
To enter in the challenge, instead of watching television
Sent his entry in on tape, concise and clearly spoke
Said this year I will win the race, the record will be broke

Well on the starter's gun they sat and waited for the bell
With morse keys and a dictionary, to ensure they all could spell
The tension was horrific, you could cut it with a knife
Then off they tapped as though it was worth more to them than life

The first one off the keys of course was Sharon Millar who
Had thrown away her words and now had nothing left to do
Jim Meachim's late decision was met with devastation
No one had a tape machine to play his oration

Dave Scott was now in trouble cause, although he broke the keys
Dr Bold was using f ags and sending semaphore with ease
Ian Ashley disappeared from sight, some say that men from Mars
Scooped him off his mountain top and sent him round the stars

Old Hoss had a bonanza, with his shiny new morse key
As from the hip he tapped his way, right through the diction-ry
David Krasch was on a roll as he manly tapped away
CQ CQ CQ this is ZL one DK

Topsy got her spoon out to stir up some emotion
QRM was all she got, for causing a commotion
Then just when it was all but done, and every one had tried
I got my chance to have a go, and key them all aside

I rattled out a rhythm that could wake the dead in hell
The others all looked worried as I began to spell
"dit dit dit da da da dit - dit dit" on I sent
faster than the speed of sound, my little morse key went

Smoke was rising from my key, I had the challenge won
I had the speed, I knew I'd win, I had a barefoot run
Then something happened to me as I walked up for the cup
CQ CQ CQ it went, and that's when I woke up

And now the tapping's over for the YL's and the men
They have settled in their corners to talk about again
The challenge that will face the HAMs at next year's s conference
When the morse keys are all taken up for the inheritance

Of being the best tapper on the little golden key
CQ CQ CQ we'll tap, to you all, seven three!

Copyright Roger Lusby 2012.

Annual General Meeting Minutes

Tahunanui Function Centre
Saturday 2nd June 2012

1. Welcome

Ali Boswijk Deputy Mayor of Nelson declared the meeting open, thanking all amateurs, and the local ones specifically for all their help in the Civil Defence Emergency last year during the Nelson floods.

After a conference photo, the AGM commenced slightly ahead of schedule at 8:55am.

2. Apologies

Branches: Rodney Branch 71, Rodney Branch 71,Te Awamutu 40, Waitomo 55, South Canterbury 34, Kawerau 67, Tauranga Emergency Communications Group 88

Amateurs: ZL2SJ, ZL1GMB, ZL1UD, ZL2AMJ, ZL2AH, ZL2RR, ZL2DW, ZL1IE, ZL2KH, ZL2ATU, ZL2ADL, ZL3TVS, ZL1TDG, ZL3GM, ZL3AKZ, ZL3DMC, ZL3HI, ZL3CAL, ZL1TKG, ZL4GS, ZL1SAD, ZL1DY, ZL1KIP, ZL1GW, ZL1LAP, ZL1BOS, ZL1BAD, ZL4AG, ZL1RO.

3. Silent Keys

The meeting paused briefly in recognition of all silent keys.

4. Confirmation Of Quorum

A quorum of 1429 was confirmed.

5. Report On Council Business

Council met in the Tasman Room of the Beachcomber Motor Inn at 10am once most Councillors had arrived in Nelson. To save the cost of an additional night's accommodation, most took an early flight to get to Nelson. Fred Johnson ZL2AMJ was not able to be with us due to family commitments.

Midlands Councillor Simon Lewis ZL4PLM resigned from Council last week and was not present for the AGM. Council resolved to fill the vacancy created by Simon's resignation preferring someone from the Christchurch area for the role. Council considered a number of names at the meeting, however agreed that the vacancy will be advertised in the next issue of Headquarters Infoline.

Simon also resigned as the VHF/UHF records keeper. Simon had been working on an extensive revision of the rules for claiming a new VHF or UHF distance record. Council has agreed that the old rules appearing on the NZART web will remain the current ones, while those submitted by ZL4PLM will remain on the site in draft form until they can be fully reviewed and approved. This position will also be advertised.

Council removed the suspension as a branch of the Hibiscus Coast Radio Society, Branch 80. The branch had recently satisfied the requirements of NZART Council in that they now have a Branch executive who are all licenced radio amateurs and members of NZART and are now able to operate in accordance with the Association's Constitution.

Council confirmed that the final stages of releasing the 2012 edition of the NZART Examination Database is almost complete. Radio Spectrum Management have one final question to approve before this can be fully adopted, however Council is confident this will be imminent.

RSM have also confirmed to NZART Council that they want only one question database to be used by all amateur radio examiners, and that NZART being the enduring national organisation representing amateur radio in New Zealand is their preferred choice. A working group has been formed to monitor and periodically update the 2012 Examination Database ZL1AN and ZL1LW have both agreed to be part of this working group.

Subscriptions for 2013:

Council has resolved that subscriptions for 2013 are as follows

Transmitting members $99.00. Family $129.00 Overseas surface $100, Overseas Airmail $115. Student $45

These new subscription rates include a small increase, except for the student subscription which remains at $45. This is the first time subscriptions have increased since 2004, thanks to careful management of funds by the Association Treasurer Evan Sayer.

The good news is that the subscription rebate is being re-introduced. The rebate for prompt payment of next year's subscriptions will be $10 if paid before 30 November 2012 and will apply to the Transmitting, Non Transmitting and Family memberships.

This year our national headquarters lease is due for renewal at the end of July. Council has been actively seeking alternative premises to house HQ, as we are very aware that a reduction in expenditure must be achieved wherever possible. Our present landlord has made us an offer to hold the current rental for another two years, with a rent review after that time, but to take advantage of that, we have to sign up for another four years. We are not sure that's the best long term solution and are looking at alternative premises in the Upper Hutt area.

We are also looking at the possibility of sub-leasing part of our office space to help keep the cost of headquarters down. Council has passed a motion that should a sublease opportunity arise, with specific terms and conditions being met, that approval for this would be granted to help reduce HQ expenditure.

This year we will again be producing a full size *Call Book*. Council feel that we now have sufficient confidence in the Ministry's database and can produce a *Call Book* with accurate name and call-sign information. Along with the *Call Book* will be a CD ROM and this will have past issues of *Break-In* included in PDF format. We also hope to include the Australian 2012 *Call Book* on the CD ROM.

A membership promotional letter will be sent to all non-members by the end of June. This has been a long time in the planning; however Council wish to ensure that this opportunity to increase membership will be well received and see some much needed interest return to the Association from those who have not renewed or not been a member in the past.

A number of Officers attended Council meeting. Don Wallace ZL2TLL gave a brief rundown on events in Geneva and the work he is undertaking with Radio Spectrum Management on behalf of the Association.

Mike Newman ZL1BNB attended Council's meeting to give us an update on his activities. Mike advised he is willing to continue in the position of LGLO for some time to come. Mike précised his success with Tauranga later during the AGM

John Walker ZL3IB, *Break-In* Editor brought us up to date with the recent changes to the *Break-In* printer and typesetting arrangements. The accounts as published in *Break-In*, show the cost of producing *Break-In* is a significant chunk of the annual operating budget. John ZL3IB is well aware of this and does regularly look at alternative printing options. The last time he did this was 18 months ago and resulted in the recent change of printer and typesetting arrangement.

John is always on the lookout for more articles for our magazine, so please submit articles to him for publication. Council approved an increase in the Editors budget to allow more colour pages. John advised it is not always possible to include colour photos due to placement constraints in the magazine; however he will endeavour to include them wherever possible.

The AREC Management team also met with Council to discuss some issues and concerns Council are confident that areas have been identified

continued on page 20

continued from page 19

in which we can move forward and assist each other for the betterment of amateur radio.

Meeting concluded at 6:30pm

6. Minutes 2011 AGM

Moved ZL1BNB Seconded ZL3IB **Carried**

7. Annual Accounts

a) Annual accounts – Evan Sayer

Evan addressed the meeting: These accounts have been prepared in accordance with the New Zealand Institute of Chartered Accountants guidelines for Not for Profit organisations. They are also audited by Parsons Roddick & Co of Upper Hutt to those same standards.

The Financial Reports have once again received an unqualified audit report. This is the thirteenth year that Evan has prepared and presented the Association's Annual Accounts and advising the Association has moved from a position of technical insolvency in 1998 to having accumulated member's funds of $246,566.

While he would like to lay claim to having accumulated those funds for members it has been the prudent management of your funds by the various Councils since 1999 with guidance from Evan and others that the Association is in this position today.

Looking at the results for this past year, Evan advised that members need to note that the subscription income has decreased by 9.4% from 2010. The actual numbers of members has reduced by some 2% however the difference in dollars is caused by the incentive given to new members who joined during the year who paid pro-rated or reduced subs. It is important that the membership numbers are maintained for the same services to be offered to members.

The elimination of the rebate for this year has affected the amount of donations received this year. The reason for this is a bit obscure but members who paid the full sub prior to the cut-off date, the rebate was applied and the additional $10 was treated as a donation. This method of accounting has some tax advantages for the Association.

The major cost saving in expenses, was in the non-publication of the *Call Book*. This together with other cost saving measures employed by the *Break-In* team resulted in a saving of approximately $25,000.

The net effect for the year was a surplus of $3473. The Accumulated members funds are principally held as bank deposits.

There was some questions as to Note 10 of the Accounts. This shows AREC as having a net accumulated balance of $80,554. Evan had been told in no uncertain terms that that cannot be the case. While they did indeed have significant income, mainly from the NZART AREC Emergency Funds Trust. This money was principally invested in new equipment and if you turn to page 22 of *Break-In* and turn the page sideways there is reported purchases of new equipment of $50 000 dollars. The total investment in assets by AREC stands currently at $80 000 after allowing for the depreciation of the assets.

While the income from Interest has remained static, the Associations bank deposits have increased, interest rates have reduced. While that's great if you're a borrower it's not so good if you are a depositor.

Evan moved that the annual accounts be accepted, seconded ZL2BHF Carried. Received with acclamation

b) Appointment of Association Auditor

Evan nominated Parsons Roddick reappointed as the Association auditors. Seconded ZL3QH **Carried**

9 Officers' Reports as published in *Break-In* issues

All reports were approved en masse.

Administration Liaison Officer – ZL2TLL

ZL2TLL gave a power point presentation on the ITU and where we belong in the structure. This presentation can be found on our web site. A brief summary is outlined in these minutes:

ITU began in 1865, three bureaux included in ITU, with the most important to us being Radiocommunications.

Every 4 years a World Radio Conference (WRC) is held to update the Radio Regulations. 3000+ delegates attend this conference from 150+ member states.

NZ Interests, harmonisation, cheaper equipment & infrastructure. Inter –operability. Reduced likelihood of interference.

Amateur interest – gaining new bands and protecting existing. Amateur specific interests were:

500 kHz, aim to get 15 kHz near 500 kHz, debate was on frequency and power limits. The end result 472-470 kHz with 5/1W (e.i.r.p). There are potential conflicts with 5 MHz from Oceanographic Radar.

In NZ we need a plan going forward to talk with MED about issues to get allocations to the amateurs, we need to talk about power limits, think about what can be done for Musick Point Radio Club as neither of their allocations are in this frequency range.

Don ZL2TLL especially thanked to Peter Lake ZL2AZ who is a Director of R 3 whose work saw the adoption of 500kHz in NZ. Peter confirmed that ZL2AMJ Fred Johnson his predecessor worked hard to secure this frequency.

Proposed radar allocation primary 77.5- 78GHz, amateurs are seen to be secondary therefore an issue may arise in this area and needs to be considered at the 2015 conference of ITU.

Don's presentation of the events of WRC 2012 in Geneva was received with acclamation.

LGLO Report; ZL1BNB

Mike advised that the task now is to get the decision of Tauranga embedded in all Council's throughout NZ.

Every 10 years Councils are required to review their District Planning standards, the time to act is just prior to this review, or amateurs would have to another 10 years or pay handsomely for the applications to be heard. Mike will be sending out a circular to branches to determine where help is needed, therefore branches need to advise Mike of the District Resource Management Plan.

AREC; ZL4JS

IARU Liaison Officer; ZL4QS

All reports were moved by ZL2HD Seconded ZL1PK **Carried**

10. Voting Procedure

A quorum of 1429 was represented therefore the meeting proper could commence.

The Vice President ZL2TW took over as chairman as the President was unable to continue.

11. Remits

Remit 1

Hawkes Bay Amateur Radio Club Branch 13 **Lost on Voices**

Remit 2

Hawkes Bay Amateur Radio Club Branch 13 **Withdrawn**

Remit 3

Hawkes Bay Amateur Radio Club Branch 13 **Lost on Voices**

Remit 4

Hawkes Bay Amateur Radio Club Branch 13 **Lost on Voices**

Remit 5

Christchurch Branch 05

End routine packet forwarding on the National System.

Amendment submitted by Nelson Branch

That this AGM directs the NZART Council to make formal request to the managers of the National System, that all packet forwarding on the National System be discontinued and the National System become a

voice-only system, so as to ref ect the desire of the greater membership.

Moved ZL2BHF Seconded ZL2BR **Carried on Voices**

A second amendment remit submitted by Franklin Branch was lost on voices.

The remit now stands as that placed by Nelson Branch. **Carried on Voices**

Remit 6

Christchurch Branch 05 **Carried on Voices**

Remit 7

Christchurch Branch 05 **Withdrawn**

12. Fixing of venue for 2012 Conference

No branch came forward at the AGM to host the 2013 Conference.

13. General Business

1 NZART Councillor Terry Thomas ZL4TAE, addressed the meeting advising that RSM will be starting a fees review in 2013 to implement in 2014. As RSM revenue is declining, changes to licence fees seem likely. NZART needs to study this area so we can have an idea of the end game so we can avoid an adverse result.

We are in a favourable position at present as to the fees regime of land mobile fees. Overseas developments seem likely to occupy 54 to 68 MHz and 174 to 230 MHz for new broadcasting services. Whether these happen to migrate to NZ is unknown. Band 2 (FM Broadcasting) will continue for the foreseeable future.

2 The President Vaughan ZL1TGC presented a PowerPoint display of the downward trend of membership to NZART since 2001 to 2011 being 1586.

Small drop in total number of amateurs, however this has increased due to branches promoting amateur radio and introducing new amateurs.

3 Several questions and suggestions from the f oor regarding the publication of *Call Book* and how to best identify those who are not members. Branches need to know this in order to encourage them to join.

4 Rory Deans advised that Tait Communications had donated $300 for the Radiotek project.

Presentation ZL1HV Awards

Jumbo Godfrey award in recognition of a member at branch level

Paul Moffatt ZL2PO	Nelson Branch
Alan Wooller ZL1AUW	North Shore Branch
Kelvin Barnsdale ZL3KB	Christchurch Branch
Stuart Watchman ZL2TW	Marlborough Branch

100% examination pass Award donated by Nelson Branch to recognise those over 20 who have passed their examination with 60/60

John Moriarty ZL2JPM, Br 50. John Kirton ZL2ALK Hastings Br 13, Simon McAuliffe ZL2SAI Wgn Br 50. Paul Kauffman ZL1PAK Nth Shore Br 29 **Rothschild Cup** – Went to North Shore Branch 29 with 19 passes for 2011. **Best Examination result** – Went to Ethan Kosoof ZL1KPJ Hamilton Br 12. **Amateur of the Year** was awarded to Barry Stewart ZL2RR for outstanding service to amateur radio. President, ZL1TGC, has been invited by Ivan Horn, to attend a Wanganui Branch meeting to present this to Barry.

The last presentation was to Roy Symon ZL2KH for his services to the Association, as Councillor and NZART President from 2009 - 2012. Frank Hunt received this on his behalf.

Prior to the close of the meeting ZL1TGC called Neill Ellis ZL1TAJ to the f oor to present him with his Councillor's badge. Neil was appointed to the position after Roy ZL2KH had stepped down as President and ZL1TGC taking over this role.

14. Stirrer's Award

ZL2TW Vice-President advised the Stirrer's Award could have gone to quite a number of members this year, (himself included as he rarely missed an opportunity to voice his quick wit; Debby) as there was a lot of quick repartee during the meeting, however none were more worthy than Ann Fraser ZL3TNT for saying "Tuff Titties to the North Island"

ZL1TGC thanked everyone for attending the AGM

Meeting closed at 2:25pm

Addendum

Wairarapa Branch has now confirmed they will host the 2013 Annual NZART Conference, to be held again at Solway Park Hotel and Conference Centre.

Conference Report 2012 Nelson

Back in October 2010 Nelson Branch 26 committed to the hosting of the 2012 Conference to be held in Nelson. A committee was duly assembled and voted in; it comprised Stewart ZL2STR as Chair, Topsy ZL2LS taking on the all important role of Secretary, Sharon ZL2BQ, Derek ZL2IF and Pete ZL2FSK. From that time on meetings were organised on a monthly rotation until the final weeks when weekly meetings took place.

The Tahunanui Function Centre was decided upon very early in the organising and also having the experience of the 2002 conference at this facility we knew it could be made to work from there. We were proved right in our selection as the committee felt the service, food and facilities that John and Yvonne provided were of the highest order and we thank them for that.

The weather for the conference was forecast to be fine and so it proved. Chilly starts to the days but beautiful days to follow. We found that most of the attendees came to the centre and registered on the Friday evening, which really helped as we were not to be bogged down on Saturday to the burden of registrations.

The Deputy Mayor of Nelson, Ali Boswijk, did us the honour of opening the conference and she made mention of how Amateur Radio played a part in Nelson with a Civil Defence role in recent times and a local school having a link up with the orbiting space station late last year. From here the attendees ventured outside for a conference photo before resuming for the AGM under the stewardship of Vaughan ZL1TGC. This continued, but broken by refreshment and lunch stops, until 14.30 when Sharon Dawson from ICOM NZ gave the conference an address on ICOM International and her role here in NZ.

Following afternoon tea the AREC AGM finished the business part of the day and preparations got underway for the evening programme and meal. This year a decision was made by the committee to not have live music so as to allow conversation to continue after the evening proceedings had finished. It has been commented on by a large number of participants that this was a good move.

Roger Lusby was the after dinner speaker on Saturday night. Roger is a poet, bush balladeer, songwriter and musician. In the week preceding conference Roger composed two compositions for presentation at this conference. "The Ballad of the Hams" and "The basics of Ham speak." These were very well received and some members of NZART were noted in them. They may even appear in "*Break-In*". His rendition of a poor Aussie bloke who had the misfortune to get his left testicle stuck in the slot of a plastic stacker chair brought many a tear to the eyes of those listening, in laughter as well as sympathy at the thought of it.

Spot prizes were dished out by Topsy and Sharon, bringing an end to the planned evening and the conversations continued.

Sunday was again fine, cold and clear and brought those who wished to an early start for the AGM's of WARO, OTC, SPAM, AMSAT-ZL. These led in to the first of the forums of the day which were grouped into three time-slots through the day rounding off at around 5.00pm. The forums were: "Techno club" and "Ham on Ice" by Kelvin ZL2KB. "Homebrew test gear" by John ZL3IB. "Radiotek" by Rory ZL3HB. "Digital voice comms for Amateur Radio" and "Frequency measurement" by John ZL4JY "Introduction to Arduino" by Pete ZL2FSK. "Marlborough linked repeaters" by Stuart ZL2TW. "QRP, mostly homebrew" by Eric ZL2BMI. "Low cost Spy satellite" by Rick ZL2HAM and "Antennas, District Plans and the RMA" by Mike ZL2BNB.

An Alternative Programme had been organised to take the participants to sample the goods and wares that Nelson had to offer. Margaret XYL of ZL2STR escorted the bus tour and handed out prizes for nearly all creating a happy atmosphere in which to enjoy the local scene. They visited amongst others the Local Saturday market, cheese factory outlets, the WOW museum of wearable art along with a car show, Mapua wharf with its galleries and a scenic tour of the hills showing Nelson's port and Tasman Bay.

Sunday evening was another meal together followed by spot prizes, drawing of raff es that had run through out the weekend and a Quiz run by Jim ZL2BHF.

We had 175 attendees register for Conference, which was really great, and which was the exactly same number of registrations as we had when Nelson hosted the Conference ten years ago.

We would like to thank each and every one of you for coming to Nelson for the Conference; we know there is an expense involved for you all to attend, and to have as many of you there as we did shows great support for the Association.

We hope you all enjoyed the Conference here in Nelson, as much as we enjoyed hosting it for you all. See you all again at the next Conference.

NOTE

Any one wishing to have a copy of the conference photo may download it from the following link <http://202.49.21.171/conf-photo.jpg>

Reporters Stewart ZL2STR and Topsy ZL2LS

Photo credits: *Stephen Hayman ZL1TPH and David Scott ZL2BCA.*

Deputy Mayor Ali Boswijk opened Conference.

Sharon Dawson told the delegates about ICOM International.

Roger Lawson ZL2BHG from Blenheim won the Icom radio.

Topsy ZL2LS and Sharon ZL2BQ organised the registration desk.

John Walker ZL3IB ran a Forum on "Home-brew test gear".

Delegates enjoyed a sumptuous Conference Dinner.

Dave Scott ZL2BCA organised the AV and sound systems.

Delegates and partners enjoying Conference Dinner.

Don Wallace ZL2TLL gave a presentation on the World Radio Conference.

The Conference station was popular.

The Basics of "Ham Speak"

A tutorial by Roger Lusby©.

As presented at the NZART Conference, Nelson 2012.

CQ: This term is used to let other HAMs know that the person is looking for a contact. In other words, he's too shy to put an ad in the adult section of the paper to attract a mate so has developed a unique call, very similar to that of the mating call of the Greater Spotted Greeb. CQ CQ CQ

DX: This is shorthand for "long distance", in other words the HAM using the call CQ, wants a long distance relationship. The reason for this will become evident when we get to the call sign XYL

73: This term originated in morse code, and was sent as a shorthand way of saying "best wishes" or "best regards" or in other words is the term of mild endearment that is now being used by CQ as a way to begin softening up a YL. YL will be explained in a moment

Another variation of 73 is "88," which is short for "hugs and kisses".

In other words, it is an advanced 73 or, if CQ is on a real winner, it describes the position he is seeking. This is more commonly referred to as 99 by people unfamiliar with the term 73 or 88.

Rig: A common term to describe the amateur radio transceiver.

Transceiver is another term for de facto, standard or connection, something again, that CQ is hoping to achieve.

It is also interesting to note that Duplex is a term used to describe a 2 way capability. Of course, this is very high on the agenda of CQ's mind when he is arranging a DX with a YL when his XYL is not around.

I feel I should point out at this stage that XYL is the long term YL of which I will now explain.

YL: is the signal for "Young Lady". Again from morse code, often used to refer to women, regardless of age, but CQ hopes it will be a younger version of YL as he already has an XYL

You will have no doubt figured out by now that XYL is short for wife, or in the case of CQ, if he is successful with having a DX with a YL, the X of his XYL, which in mathematical terms is commonly used as the name for an independent variable, or unknown value, will become what we understand more fully to be, a past, previous, or historic factor in CQ's life, which I am sure CQ will by now be hoping to replace with the YL he is desperately sending out his signals to.

"Q" SIGNALS. Q Signals are the three letter shorthand that got its start in morse code, to shorten the sending of common questions and responses used in transmissions. In other words, now that CQ is increasing his urgency to attract his YL, he is shortening his call to Q, on the understanding that he will get more Qs out in a short time, so increasing his chances of securing YL for an 88, regardless of the DX involved in the case.

Then there is QRM: Interference (man-made, such as another close by station, or malicious interference). This is of great concern to CQ because, as his situation is DX, a QRM may have a greater chance of securing YL in the much desired 88, before CQ has time to ensure his RIG develops QRP.

For those who are unfamiliar with QRP, that is another term for low power.

QRN is also likely. This is interference such as at times when noise level is high, and in this case, it is very likely to be emanating from CQ's XYL, as she will have no doubt, by this stage, become aware of CQ's DX with the YL and the desired 88.

This is also going to lead to the XYL doing a QRT on CQ. QRT of course means signing off or the ending, and with all the QRN going on, CQ will be getting a QSB, or fading out from YL, leading to the lack of a QSL, which is the equivalent of a good Rogering of YL by CQ after he has completed his QSO, or conversation.

So, to end this tutorial on a QSY or different frequency, that would enable CQ to QTH, or change his location, so he can run barefoot with full quieting to his YL.

I suggest CQ takes a short skip.

Copyright Roger Lusby 2012.

QSL Bureau

by Barry Stewart ZL2RR
<zl2rr@xtra.co.nz>

Greetings from Wanganui. The QSL business has gone into the doldrums somewhat after a New Year avalanche of incoming DX cards. I recently posted a near-12 kg parcel of QSL cards to Japan: Such were the numbers of cards received from the ZL fraternity responding to the approximately 12 000 QSL cards received from JA during the first four months of 2012.

Since the report in the May-June *Break-In*, postings to the various ZL sub-bureaux have been: ZL1 Prefix Sub-bureau 1 x 5 kg parcel in May; ZL2s' Sub-bureau 1 x 5 kg parcel in May; ZL3 Sub-bureau: 700 g envelope postings were May (3), June (1) and July (1) and ZL4 Sub-bureau May (1) and June (1) with one being held until Dave ZL4OZ returns to duty. These small numbers of postings reflect the fall-off of incoming overseas mail to the central bureau.

The German-led ZL8X DXpedition of November 2010 resulted in an influx of QSL cards to the ZL Bureau for that operation; more so than any previous foreign DXpedition to our shores. The main problem here was that despite the majority of cards being plainly marked-up for the group's manager and forwarded to his home bureau, this bureau insisted on sending them on to ZL. As a result, a near-3 kg parcel of these cards was recently mailed direct to the DXpedition Manager from here.

As you now will be aware, New Zealand Post increased the domestic postage rates from July 1 2012. The standard envelope postage rate increased by 10c to 70c (or 1 Kiwi stamp), the A5 sized envelope by 20c to $1.40 (or 2 Kiwi stamps) and the A4 size envelope went up to $2.10 (3 kiwi stamps) from $1.80.

A friendly reminder: If you have Self Addressed Stamped Envelopes (SASEs) on hand with your local QSL Sub-bureau, please be kind enough to forward a few 10-cent stamps to the sub-manager to enable him to meet the new charges. Please use the 'Kiwi' stamps on any SASEs you send to him in the future as these stamps stay current for whatever the cost of posting the envelopes you supply.

The standard 70c envelope has a maximum thickness of 5 mm or 200 g; whichever comes first! Five mm of QSL Cards is not many! I frequently receive red-stickered standard envelopes informing me of the thickness transgression and warning me that the item may have been delayed because of insufficient postage. The 'A5' (C5) envelope has a maximum thickness of 10mm or 200 g; whatever comes first and the 'A4'(C4) envelope has a maximum thickness of 20mm or 750 g; – whatever comes first.

To conclude this column, firstly I sincerely thank all those members who have kindly enclosed a donation with their QSL cards these past two months. The Association is most appreciative of your generosity and, secondly, please remember that if you have any questions, queries (QSL Managers/addresses etc) or comments, please feel free to contact me either via mail (1 Caversham Road, Wanganui 4501 or Box 857, Wanganui Mail Centre 4540) or Email <ZL2RR@xtra.co.nz>

73 *Barry ZL2RR*

Monitoring Service

Monitoring Service Co-ordinator: John Martin ZL1GWE
<john.martin@nz1.ibm.com>

Greetings to all, including Short Wave Listeners and contributors. A couple of months on, with propagation conditions dipping and then increasing have caused the normal 15 metre OTHR (Over The Horizon Radar) systems to become more prolific on 20 metres, much to many people's chagrin as they disturb DX skeds such as the ANZA net on 14 183 kHz. People have many of ways of coping with this "harmful interference", ignore it, cope with it and time transmissions or just repeat again, or simply move up the band or another band or simply give up.

How about an alternative? Reporting it would really be helpful to the AR community. A simple request: date/time, frequency and mode, will do, so that others more interested can zoom in and review the "harmful interference".

The HF Man Packs on 80 m and 40 m are still prolific, at many times of the day, but can be observed occurring across all AR HF allocated frequencies. Watch out for more frequent updates within the NZART Infoline bulletins.

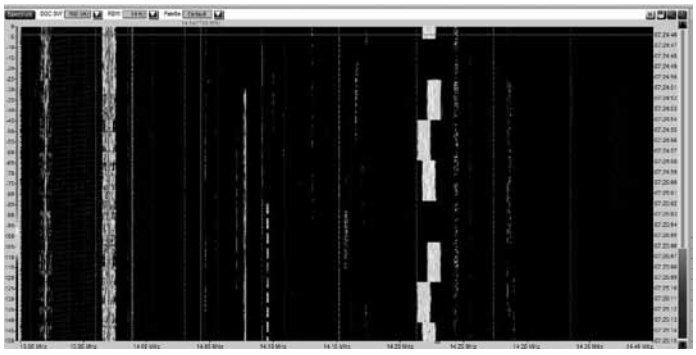
Note: CODAR signal below 14000 kHz out of band and OTHR (Radar) 14 220 kHz approximately. Sometimes 20 m is strewn with many different rates or Pulses per Second (PPS) rather like a set of searchlights. The OTHR above incidentally, has a rate of 66 pps. The transmission beside this signal is a normal AR SSB transmission. The signal below 14 100 is an amateur radio Pactor system.

For those who want to participate in the NZART Top Intruder System Observer Award for 2012, here are some easy places to pick up intruders on 20 m:

Some additional pointers will be provided in next edition. Please report intruders to: <MS@NZART.org.nz> or <MS2@NZART.org.nz> or <IntruderWatch@GoogleGroups.com> or to your favourite DX Cluster.

If you have any questions, do not hesitate to contact me directly.

John (ZL1GWE)



State of the band: 20 metres snapshot 23 June 2012 at 0723z

Intruder System Observer League Table 2012 (up to end of June 2012)	
Contributor Name/ Call-sign	**Number of verified reports**
John ZL1GWE	469
Bob ZL1BAD	183
Brett, ex VR2BG/P	33
Stephen ZL1TPH	31
Phillip ZL2TZE	28
Rex ZL4IV	4
Gary ZL2iFB	4
David ZL1DGK	3
Dallas NZRDXL	2
Bill ZL3NB	1
ZL2AAA	1
Others	0

Frequency	Identifier	Comments 20 metres
14000*	IND	Indonesian non-amateurs singing but can also occur in other places within 20 metre band.
14000*	OTHR	PXX Suspected source: Chinese, Turkish, British, Russian, New Zealand, Australia Over The Horizon Radar (Spreading out of band) > or < 5 to 83 Pulses per Second (Could occur inside or outside of 20 metres)
14000*	N0N	Suspected Inter Modulation Distortion (IMD) or Broadcast Station carrier.
14000*	CODAR	VXX Coastal Ocean Dynamics Applications Radar suspected source: many countries > or < 2 Pulses per Second (swish, swish type sound) (Could occur inside or outside of 20 metres)
14000*	PSK8	ALE 125 Bd 1750 Shift (Could occur anywhere within 20 metres spectrum)
14000*	G7DF	HF Man Pack PSK-8 or PSK-6 (Could occur inside or outside of 20 metre spectrum)
14008	F1B	Russian Navy 50 Bd, 250 Hz or 500 Hz idling or fully encrypted (Could occur anywhere within 20 metre spectrum)
14024	PSK2	AT3004D Russian Military Modem, encrypted (Could occur anywhere within the 20 metre spectrum)
14295	A3E	Radio Tajikistan or carrier

Jamboree on the Air

October 20 and 21 2012

For 55 years, the Jamborees on the Air (JOTA) have enabled scouts and guides all over the world to speak to each other with the assistance of amateur radio. Starting with a handful of scouts taking part in 1958, there was rapid growth, but it has slowed over the past several years. Combined with JOTI (Jamboree on the Internet) participation, which is now in its 16 year, something like about a million scouts and guides all over the world took part last year. New Zealand scouts and guides have benefited from participation in JOTA for over 40 years, and in JOTI since its inception. Some have had their interest whetted by this exposure and gone on to gain their own ham licences.

JOTA and JOTI are coordinated by the World Scout Bureau located in Geneva, and there are national organisers for them in each country in which there are scouts and guides. I have been New Zealand's National Organiser for the past 40 years. European national organisers have a triennial seminar, and I have had the pleasure and privilege of attending the past five of these. At the latest one held in Lisbon earlier this year, we saw every reason to aim for a significant increase of growth in the coming years. A target of attaining three million participants (ie, trebling the present participation) by the year 2015 was considered achievable and scout and guide associations in each country are asked to work towards this goal. I am certain that we in NZ can easily achieve more than a threefold increase in participation and I will be encouraging scouts and guides here to take part in JOTA, also in JOTI.

JOTA is an excellent activity for amateurs to help scouts and guides make friends all over the world, and to show youngsters what amateur radio can do. The experience could perhaps make radio amateurs of them. I ask you please to assist our scouts and guides to take part in JOTA this year. This year, the event is on the Saturday and Sunday of Labour Weekend, but operating may continue on the Monday so as to contact stations in the Pacific on the other side of the international date line.

Jim Parnell ZL2APE National Organiser for JOTA and JOTI

DX Downunder

Graeme Hunt ZL1ANH and ZL1T
<graemeh@xtra.co.nz>

Yemen. The appearance of 7O6T in May was a pleasant surprise to the DX community since there had been no major activity since 1964. For the first week the pile-ups were incredible, but contacts gradually became easier, and by the end of their stay it was easier to work them. Their operators were outstanding, particularly on CW. When their operation ceased, they had 162k QSOs and 87 ZLs were in the log, many with multiple band/mode QSOs. ZL3IX even managed them on 160 m.

Somalia 6O0CW was the second DXpedition to pop up from the Arabian Sea area. Like Yemen there had been little prior publicity. Again many ZLs went into their logs.

Sable Island is off the eastern coast of Canada. CY0/VE1AWW Alan informs us that he is QRT due to migratory birds being hampered by his antennas. The Canadian authorities who control the island, which is a natural reserve, have ordered the immediate removal of all antennas. Hopefully Alan can sort the problem as he had a very strong signal in ZL.

There is a trend for the really rare DXpeditions to suddenly appear on the bands with little or no notice. They are doing this as one measure to improve security, while giving fewer opportunities for pirates to imitate the operation. It pays to keep your ears open and eyes on the spotting websites. Comoros is probably the next one to suddenly pop up.

Thailand: During the devastating 2011 flooding in Thailand, Thai hams assisted with disaster relief to the extent that their authorities have now relaxed their licence conditions. Previously there were over 150 000 licensees restricted to 10 watts on 2 metres FM only and only a few with full HF privileges. Expect a lot more HS/E2 calls on the HF bands

Congratulations to Barry ZL2RR, ZL QSL manager, awarded Amateur of the Year award at the June NZART Conference. I know all ZL DXers appreciate the tireless work of the QSL bureau.

While on the subject of QSLs, I got an interesting note with a QSL card from Venezuela, "Could I please QSL so he could upgrade from the YY prefix to YV." They must have a requirement to have a certain number of cards before getting the elite call prefix, or maybe there are limited band privileges depending on how many countries confirmed.

From around ZL

Phil ZL3PAH: Highlights for me the last couple of months have been some good DX and new ones worked here despite only having a vertical (SteppIR BigIR) and QTH with more than 180 degrees shielded by a very close cliffs. Although I do note that the sea on my doorstep and ability to run close to 1kW helps. So real highlight has been 7O6T on 4 bands (20/17/15/12m) and also CW & RTTY. Also five all time new ones worked all in one week have been A5A (15 m), JY4NE (20 m), ZS6NJ (30 m); Africa very difficult indeed from here, SU9VB (15 & 20 m) and 4S7NE (17 m) all worked in one week. Takes my total worked to 214. It does go to show that you can work DX without a beam! Looking forward to upcoming DXpeditions over the next couple of months; 1A0C (Sovereign Military Order of Malta), CY9M (St Pauls Is), D64K (Comoros) & NH8S (Swains Is) to hopefully bump up my total count.

Ian ZL1OGX: I have been spending some time playing with digital modes, as the shack is in the same room as the TV so when the XYL is watching TV I can still play radio. Running a IC-706Mk2 at 30W to a Diamond CP6 vertical I can make regular contacts with EU stations most nights. Activity has been most JT65 over the last couple of weeks, thanks to WES, ZL3TE, for some heads up on the setting for JT65-HF software. It is amazing to see that the contacts via JT65 have been really fast at being confirmed via LOTW, some even on the same day as the QSO. Granted it's not really a QSO mode where you get a slight rag chew but it covers the bare minimum for a contact. Contacts so far from F, DL, EA7, IK, VE, K, VK & ZL on this mode. Lots of US stations appear to be active, makes me think that I should be looking at trying for WAS on JT65.

ZLPW: Excellent daytime openings to the Middle East on 12, 15 and 17 m. Also worked D2 on 17m at 0630z on SP so there is some good DX about for the patient;. including TT8PK who is in Chad again with the French Army.

ZL3IO: Conditions are fair, but a bit down from around December and high bands close earlier but most of it may be related to the time of the year and activity. WPX CW was the best example for good conditions with 20/15 m open and busy 24/7. There were a couple of big flares/CMEs in June but there are great LP openings into Europe on 10/12/15m in the local mornings.

7O6T Operators, Socotra Island, Yemen.

David K3LP operating 7O6T. David says its easier on his back to operate for many hours on his knees rather than sitting in a chair.

DXCC Honour Roll

Most will be familiar with ARRL's DXCC. The ultimate DXCC is the Honour Roll, (or Honor Roll if your call-sign begins with a W/K.) Currently the total possible is 340 and to qualify you must be within 10; that's 331 countries, bits of remote rock and tiny enclaves.

In my case I have 9 to go, and now offer readers an opportunity to demonstrate their DX knowledge;

DXCC Quiz

Here are 9 of my 18 possibles:

1. Asian country where no amateur operation permitted. New ruler recently.
2. African country previously named after black, white and red African rivers.
3. Asian country, no operation for some years but one part-timer now. Name change in 1989.
4. Pacific Island group that both Amelia Earhart and ZL1ANH failed to reach.
5. Eastern Orthodox monastery, monk sole operator (or is that soul operator?)
6. Uninhabited Norwegian dependency, 93% glacier, and the most remote island in the world, 54°S
7. Group of Chilean Islands 850km out into the Pacific, DXpedition there in 2002.
8. Landlocked African republic, west of Sudan, east of Niger.
9. Island in South China Sea, ZL4PO was a DXpedition member there in 2003.

Email the 9 countries in the order shown to <graemeh@xtra.co.nz> and you'll get an honourable mention in next month's column.

Two pieces of advice even if not

Physics; and the Reality of Amateur Radio Antennas

by Phil Slater ZL2OWL

As experienced radio amateurs are well aware, all of the know-how, construction skills and money invested in radio receivers, transmitters and our modern day 'combo' transceivers, whatever the intended frequencies/wavelengths of operation, is to little or no avail if the antenna is seriously deficient. Rule of thumb: 80% of effective radio communications depends on the antenna, just 20% on the rig feeding it; just ask any competent QRPer. Wishful or ignorant thinking about antennas can't sidestep fundamental realities of physics; those realities govern all forms of radio antennas, including our amateur radio antennas.

It's a foible of human nature that matters complex and not easily understood tend to be dismissed by the uninitiated as 'magic'. 'Magic' means that complex realities are easily overlooked by well-meaning but ill-informed people. Radio antennas, with their esoteric (certainly to the layperson) considerations of wavelengths, frequencies, power handling, gain, front to back ratios, feedlines, velocity factors, alignment, height above ground, take-off angles and so forth, fall into the realms of magic.

Hence, it becomes a serious problem when communities want the comfort provided by volunteer amateur radio EmComm capabilities for possible emergencies and disasters; but don't understand the fundamental need for effective and efficient antennas.

Whose problem is this? The problem, absolutely, is ours – the amateur radio community. If we fail to explain our position clearly, and inform those who wish their landscapes (in today's local body pop jargon, 'visual amenities') to be clear and 'Monet idyllic', and fail to explain the consequences of emasculating amateur radio (and, for that matter, other essential-service related) antennas, we have allowed bureaucratic ignorance to put communities in 'harm's way'. Time and again around the world, in disasters involving loss of 'regular' public communications, radio amateur volunteers have assisted by competently establishing and operating life-saving rapid-response radio links. When all else fails amateur radio can still work…but only if proven efficient and effective antennas are available.

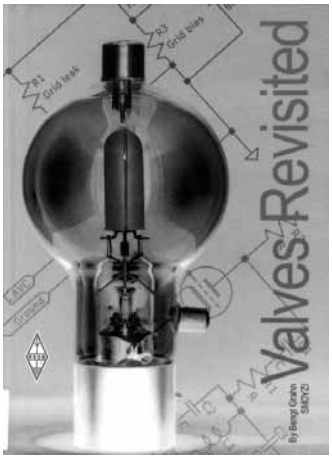
Efficient and effective radio antennas are a key and essential element of amateur radio disaster preparedness. We must never knowingly allow them to be emasculated by naive ill-informed thinking. βi

Phil ZL2OWL

Book review

Valves Revisited

by Bengt Grahn SM0YZI
Published by RSGB 2011, 262pp, ISBN 9781 9050 8670 9.
Price £stg 16.99.
Reviewed by John Walker ZL3IB



Valves (or tubes) have played a key role in amateur radio since the earliest days. They were key components of receivers, transmitters, PA amplifiers, TV sets and the earliest computers. However since the advent of the transistor in its many forms and developments valves have almost vanished from the amateur radio scene although they are still often used in high-power linear amplifiers and by some audio HiFi buffs; they are also important for people interested in the restoration of vintage radio sets.

In this book the author introduces us to the basics of valve design, construction followed by a more detailed description of their use in a wide variety of circuits. The emphasis is mostly on the use of valves in receivers, audio amplifiers and power supplies with several examples of practical circuits for budding constructors. There are also several useful circuits and designs for items of valve-based test gear and a chapter on fault-finding. However I was disappointed that there was no discussion of valve testing and valve testers; this would have been useful.

A rather 'skinny' Chapter 18 discusses some AM and CW transmitter basics. Finally Chapter 19 provides comprehensive listings of web-based sources of information on valves and valve-based equipment.

As an "old-timer" who grew up with valves and is familiar with them I found this book rather disappointing but nevertheless it could provide a useful introduction to the world of valves for someone unfamiliar with this area of radio technology. βi

currently chasing the DXCC award:

1. QSL if it's rare. I never bothered until a few years ago and there are several on my list I worked years ago and never confirmed.
2. Live for a long time. That's pretty good advice generally, although I wouldn't give it to absolutely everyone.

DXpeditions

Burundi 9U; look for HA3JB, now living there. 20 m SSB and PSK31

Comoros D6; date and call to be announced – probably August or September

Campbell Is; ZL9HR 17 to 30 November

Gabon TR; Sebastien F4EIH, will be in Gabon for at least three years

Jan Mayen; JX9JKA till March 2013

Lebanon; OD5/IV3XN till October

Swains Island; NH8S September.

Silent Key

Bill Wells VK4UA passed away recently. Bill had been a net controller on the ANZA net for many years and helped many ZL amateurs with DX contacts.

Nets

ANZA Daily: DX net at 0515z on 14183 kHz and now also Saturdays 0445z on 21205 kHz. Mondays, Fridays and Saturdays it is followed by the Pacific DX net on the same frequency from 0600z.

Arabian Net: Fridays only 0500z 14250kHz; host JY5HX and features exotic Middle East calls.

ZL Dxers: Tuesdays 8pm NZ 3777 kHz

What's on the air now? <www.DXsummit.fi/DxSpots.aspx>

QSL information: <www.qrz.co>

Acknowledgements

425 DX, OPDX,

Contact me at *Call Book* address, or by email at <graemeh@xtra.co.n>.

Digital Modes

Murray Greenman ZL1BPU
<zl1bpu@nzart.org.nz>

More Kites

In the last column I mentioned the use of kites for antennas; not something you should bother trying unless you have plenty of space and a team of people. I knew I'd seen some articles about practical experience with kite antennas, and during the last month or so I managed to unearth two. My thanks go to Michael DF2OK (another keen kite f ier) for the photocopies.

The first article[1] reported on the efforts of Dutch club team PI4ARA, who set a new record for multi-band horizontal kite-borne antennas. The antenna height was 102 m, and was used for DX contacts on 80, 20, 15 and 10 m. The site used was a park in the town of Almere, near Amsterdam, and below sea-level!

The antenna they used was a coax-fed FD4 multi-band design, 40 m long ,supported by a total of six large kites of the Rokkaku design. Three supported the centre, the balun and coax, another kite was half-way down the centre f ying line to prevent it sagging, while one supported each end of the dipole, with associated guy wires to keep the antenna from sagging. The force on the centre f ying line was 1500 kg! The effort took all day, and late in the afternoon some excellent QSOs were made.

The second article[2] was a more general discussion of how to go about putting up a more modest kite antenna, much as I described in the previous column. It has some good ideas.

MEPT Kits

The first of two new MEPT kits I shall mention is the neat little Etherkit unit about 50 mm square[3]. It is USB programmed, but operates stand-alone. It will operate a range of modes, but surprisingly, is only available for 30 m, and is crystal controlled! The modes include the strange 'glyph' code mode seen recently on 30 m, which consists of different Sequential Multi-Tone Hell graphics for dots and dashes - more about that later. I've not been able to work out who the designers of this kit are, or who is supplying the kits. K6HX and K7TP have reported running this new kit.

The other kit is very sophisticated, and by QRP and DIY veterans G0UPL and G0XAR[4]. I quote from an email from Hans G0UPL:

"The kit supports WSPR, QRSS, DFCW, FSK/CW, Hell (full speed), Slow Hell, and customisable patterns. WSPR encoding is on chip. It supports connection of a GPS module for frequency locking, accurate time, and location (for WSPR). Power output is 185 mW. We will sell versions for 30/40/80m and perhaps 160 m. It does not require a PC, it has an LCD and two buttons to control it."

Despite the undoubted sophistication of this kit, it is still just a crystal-controlled single-band unit. What is it about these designers that they stick with primitive (and not so stable) fixed designs when they could be using equally simple to build (but much more sophisticated and versatile) synthesizers such as the Silicon Labs Si570?

My preferred MEPT exciter is still the QRP2000 design[6] by Tom DG8SAQ. This uses the Si570, and although it needs a separate power amp and a PC to run it, it can be used for many modes on all bands from 110 kHz to 260 MHz. I built a simple 100 mW Class D PA for mine, which operates 2200 m to 6 m, and I routinely use it for tests on 600 m (the MF Net on Thursday evenings) with a 10 W Class D amplifier built by Graham ZL1QM. See the 'snippets' section for an ideal 20 W FET power amp for this MEPT.

MT-Hell and Glyph Codes

As some of you will know, MT-Hell is a technique that uses brief carriers on different transmitted frequencies to paint patterns at the receiving end on a spectrogram program such as ARGO. Generally these patterns are text, but simple graphics can also be used.

The first MT-Hell system was a parallel carrier electromechanical system developed by French company LMT in 1937. It was rediscovered and redeveloped for SSB transmitters

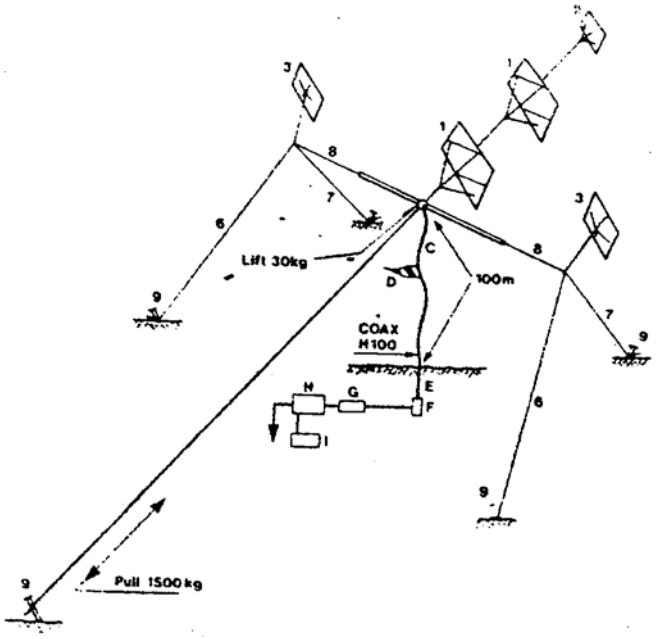


Figure 1. The amazing PI4ARA kite antenna (from Radio Communication Oct 1989).

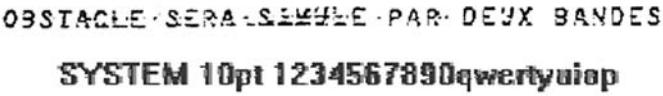


Figure 2. C/MT-Hell reception examples; LMT (above), G3PLX (below).

using audio tones from the (then new) PC sound card by Peter G3PLX in the mid 1980s. These systems were what we would now call 'Concurrent Tone' or C/MT-Hell.

Surprisingly, the now much more popular sequential carrier system (S/MT-Hell) was not invented until 1988, when Murray ZL1BPU (that's me, folks) demonstrated it and held a first two-way QSO with ZL1AN on 80 m. This early version (called Mosaic) had a fixed 20 ms dot length and an unusual 'grid' appearance at the receiver due to keying sidebands. Receiving software was an early version of Gram by R.S. Horne[7].

S/MT-Hell was developed for a number of reasons. One was simply because I was writing test software in Quick Basic without the benefit of sound card drivers, so could not generate multiple tones (carrier segments) at once. The other reasons are much more important, and remain so today; with only one tone at a time, you can (a) use an FSK or synthesizer frequency source; (b) use a non-linear (e.g. Class C) transmitter, at full power, whereas for concurrent tones you needed a highly linear transmitter with the average power kept low enough that it would handle the peaks when all tones were on together. I had also discovered (c) that carrier segments sent with shorter duration than the sampling time of FFT software at the receiver would 'integrate' or merge, and form clearly visible images, although with some loss of sensitivity. This loss however turns out to be a gain relative to C/MT-Hell when using the same peak transmitter power.

I have had the pleasure of working Peter G3PLX on only a few occasions – one was the world's first PSK31 QSO ever to the southern hemisphere, but we also later had a C/MT to S/MT Hell QSO (which proves the compatibility of the modes). At about the same time I worked Eduardo EA2BAJ with S/MT to C/MT Hell, which still stands today as the world record distance for a live

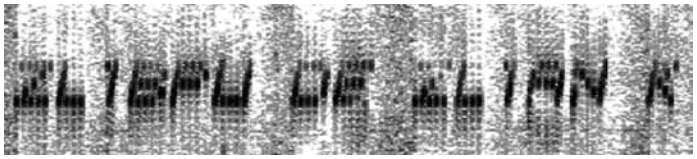


Figure 3. The world's first Sequential MT-Hell QSO, 1988.

Fig. 4. Reception at EA2BAJ of my S/MT-Hell, 1989.

keyboard MT-Hell QSO. For this QSO I used a dual vertical stroke version of S/MT-Hell, which was slower but gave better DX reception and character shape

S/MT-Hell deployment involves compromises. In order to make the character shapes reasonable, without excessive tilt (caused by not being able to send all of a vertical stroke at the same time), you need to use as few dots per column as possible (typically five), so there is a trade-off in readability between character quality and tilt. I developed a number of techniques which would improve matters, such as rendered characters with in-between dot frequencies (for example use only 5 tones per column, but spaced in a 9-tone matrix), by using double strokes (as in Figure 4), and by omitting or reducing the time spent on non-transmitted spaces between dots.

Early S/MT-Hell work was real-time (keyboard sent) on HF using reasonable power and bandwidth, and dot speeds roughly compatible with the C/MT-Hell of the time, typically about 10 wpm. This required dot lengths of about 20 ms and fast spectrogram software. More recently S/MT-Hell has found a new and highly important life as a weak-signal modulation technique for MEPT transmitters using ARGO as the receiver in QRSS3 mode. Here the dot duration is typically (and conveniently) one second, with carriers spaced 1Hz.

In the MEPT environment, S/MT-Hell is ideal, as it can be generated using either a simple FSK crystal oscillator or a synthesizer chip, and can be amplified by simple CMOS digital chips to the 100 mW level. A graphical message script technique I developed more recently, specifically for MEPT, permits transmission of mixed modes (S/MT-Hell, CASTLE, FSK or ASK CW, simple graphics, or even WSPR and OPERA). This technique describes a graph on which you draw dots (16 rows high) as a string of Hexadecimal text 0-9 and A-F, which is then interpreted as tones by the transmitter.

For some reason, which escapes me, a variation has been introduced to MEPT operation recently, where Morse symbols are generated as S/MT-Hell graphics! Why in the world make a graphic, which occupies considerable bandwidth, and takes a lot of transmission time, in place of a single frequency dot or dash? You may see these glyph codes on 30m, typically as triangles, one way up for dots, the other for dashes, or as diagonal lines etc.

I suppose there is one advantage to the glyph codes; by taking up bandwidth they are less susceptible to multi-path Doppler effects and perhaps to carrier interference, but a lot of sensitivity is lost compared with good-old-fashioned FSK CW where all the power is concentrated on a single frequency. Maybe the real answer is that folk developed glyph codes because they could…in the same way as other poorly thought out modes were cobbled together (Opera, Contestia and Olivia come to mind!).

Snippets

People do mad things from time to time; and valve enthusiasts are not immune to this disease! I've seen a report from Peter M0FMT requesting reports on his 600 m transmissions, but it is his rig which is the point of interest; a 12AU7 dual VXO master oscillator with two crystals, 6.5 MHz and 6.0 MHz, a 6AU6 mixer and 6CL6 power amplifier!

There's a new version of ARGO, version 140[8], with increased frequency span. When you run it, hit the numeric keypad '+' key to increase the vertical size in 100 pixel steps, and '-' to reduce it. This latest release also has improved timestamps on the screen and has internet grabber posting built-in.

There's an interesting GPS Disciplined Reference design recently released by Pietro IK0OTG[9]. It uses a simple hardware time interval counter and PIC processor. He also presents a very impressive little HF amplifier design, using MOSFETs. It operates 160 m to 6 with 20 W output, and it also has a fair bit of gain, 43 dB. Just add a PLL or DDS synthesizer and you're in business, all bands!

This is good information!

STROKE! Remember the First Three Letters "S T R".

Stroke Identification

During a BBQ, a friend stumbled and took a fall. She assured everyone that she was fine (they offered to call paramedics) and had just tripped over a brick. They got her cleaned up and brought her a new plate of food. Whilst she appeared a bit shaken up, Ingrid went about enjoying herself for the rest of the evening.

Ingrid's husband called later telling everyone that his wife had been taken to hospital. At 6:00pm, Ingrid had passed away; she had suffered a stroke at the BBQ. Had they known how to identify the signs of a stroke, perhaps Ingrid would be with us today? Some don't die. They end up in a helpless, hopeless condition instead. It only takes a minute to read this.

A neurologist has stated that if he can get to a stroke victim within three hours he can totally reverse the effects of a stroke—totally! He said the trick was getting a stroke recognised, diagnosed, and then getting the patient medical care within three hours, which is tough.

Recognising a Stroke

Remember the three steps, STR. Read and Learn!

Sometimes symptoms of a stroke are difficult to identify. Now doctors say a bystander can recognise a stroke by asking three simple questions:

- **S** Ask the individual to SMILE,
- **T** Ask the person to TALK to SPEAK A SIMPLE SENTENCE (Coherently) (i.e. "It is sunny out today").
- **R** Ask him or her to RAISE BOTH ARMS.

Note. Another sign of a stroke is this. Ask the person to "stick our their tongue". If the tongue is "crooked"; if it goes to one side or the other; that is also an indication of a stroke.

Clocks

Next time I hope to discuss some interesting talking clocks, so if you have one, or a story about one, please let me know.

I'll leave you with a couple of examples of Amateur time clock beacons. The first is pendulum timed(!), and has no claims to frequency accuracy. OK0EPB operates this unit on 7039.4 kHz, not that I've heard it[10].

I built a much more sophisticated time and frequency system a few years back[11]. Everything was locked to a homebrew GPS disciplined reference with impressive accuracy of both frequency and time code. The time code I used was the one used by Australian time and frequency station VNG (QRT these past 12 years). The plan was to apply for a permit to transmit on 5 MHz, but with the death of my partner in crime (the late Ted ZL1MT), who was to build the transmitter, remote telemetry, and provide the operating site, the idea died as well.

References

[1] 'Flying Dutchmen', News Reports column, Radio Communication, October 1989

[2] 'Kite-borne Antennas for HF Portable Operation', Dave Lunn G3LSL, Radio Communication, February 1988

[3] <http://docs.etherkit.com/OpenBeacon>

[4] <http://www.hanssummers.com/giving>

[5] <http://www.hanssummers.com/>

[6] <http://sdr-kits.net/QRP2000_Description.html>

[7] <http://w5big.com/Spectrogram517.zip>

[8] <http://dl.dropbox.com/u/15089947/Argo140.zip>

[9] <http://www.ik0otg.net/lang=en>

[10] <http://ok0epb.nagano.cz/>

[11] <http://www.qsl.net/z/zl1bpu//MICRO/VNGBOX/index.htm>

VHF Scene

Simon Watt-Wyness ZL1SWW
<zl1sww@nzart.org.nz>

Well it's time for another edition of the 'scene. This time it's coming from a motel room in Whakatane as I am on a project here that seems to be taking more and more time. As we approach winter, activity wans both from a propagation standpoint but also because it's too cold to go hill topping! Anyway, on with the show!

Branch Activity

On Sunday 17 June, the Waikato VHF group came up to Auckland to visit the ZL1ZLD Musick Point club branch 86. There was a good turnout and a very successfully run event thanks to the great organisation skills of the branch members. The weather was kind and it allowed us to congregate outside for a good catch up and enjoy the fine day.

A barbeque was put on with many tasty morsels and a DSTAR presentation from Sharon and Eddie from ICOM NZ was held for the interested parties. The room was filled. Some live radios were there and were connected to a ref ector, showing the connection and hearing overseas traffic.

It was a good get together to meet new faces and catch up with our Waikato friends.

Beacons

Lorne, the NZART *Call Book* / Map editor, has come up with a new format for the Beacon listing/map Any updates on statuses please send to Kevin ZL1UJG or Steve ZL1TPH. The URL is <http://www.nzart.org.nz/assets/maps/current/bea.pdf>

6 metre Activity

Peter ZL4LV reports on his 6 m activity. Up to the time of writing this on mid-winters day there has been some activity for the winter 6 m sporadic E season. On the 12th of June I worked VK7DX and ZL2OK, the following day the band was open again and ZL1NX, VK2BCC and VK2ZQ were worked. The next opening was on the 19th where contacts were with VK3DUT, VK2BHO, VK-3DUT again and VK7DX.The band seemed to open in the afternoon, signals are generally not very strong with considerable QSB but workable.

Bob ZL1RS has been working into VK on 6 m as well.

2 metre Activity

Judging by the activity on the VK logger, the FSK 441 activity is still on with many people in ZL contacting VK on the weekends.

Peter ZL4LV also adds that Meteor Scatter operation continues each Saturday Morning from 0800 until 0900 on 144.33 MHz attempting to work VK. Use the VK Logger on the internet for liaison. Bob ZL3TY with his excellent location on the West Coast has no difficulty in working all the active stations. However, here in Dunedin on the East Coast the situation is more difficult. Working VK7 is normally good but further north on the mainland is difficult. I have been heard in VK2 and VK3 but no full contacts have eventuated. During a recent contact with Rex VK7MO I was ticked off for not following the correct procedure for a contact, I was using the same procedure as used for moon bounce but that is different. The following is a procedure supplied by Rex as to the correct way of doing shorthand:

Procedure as discussed is below. Note also that Short-hand or Single Tone (ST) messages are only TXed if you both tick the SH box and choose a short-hand message. It will highlight in Blue to show it is TXing in Short-hand.

Insert FSK441 VK/ZL Procedure

WSJT provides two standard procedures for North America and Europe. In VK/ZL we have developed our own procedure that is optimised for the activity sessions and has advantages that it allows one to work more than one station at a time and explicitly identifies the transmitting and receiving stations. An example of a QSO sequence with two stations is as follows:

The messages can be typed by hand into any of the 6 TX message positions on WSJT. Even if you are working only one station there is benefit in using this procedure as it helps others who are monitoring to identify the station transmitting as this station does not have a "/" after the call-sign.

Transmitted by VK7MO	Transmitted by other Stations
CQ VK7MO	
	VK7MO/26 ZL4LV
ZL4LV/R27 VK7MO	
	VK7MO/27 VK1WJ/26 ZL3TY
ZL4LV/R27 ZL3TY/R37 VK7MO	
	7MO/RRR VK1WJ/26 ZL3TY
ZL4LV/R27 3TY/73 VK7MO	
	VK1WJ/26 ZL3TY
	7MO/RRR ZL4LV
4LV/73 VK7MO	

An example of a QSO sequence with two stations.

Note that after call-signs are exchanged in full both ways it is acceptable to abbreviate the call-sign of the station you are working but your own call-sign should be sent in full for the benefit of other stations who might wish to call you. It is generally impractical to work more than two stations because of the limitation of WSJT on the number of characters that can be transmitted. If you do attempt to transmit a long message check the message actually being transmitted in the bottom right hand corner of the WSJT window in case it is truncated.

Activity Sessions are held on Saturday and Sunday mornings as below and all are welcome to participate. Times are local times in VIC/NSW/ACT/TAS.

It may seem odd that all stations operate on the same frequency but the above procedure ensures that stations in the same area are transmitting and receiving at the same time and if their computer times are accurately set should not interfere. In general meteor pings from stations in the same area do not overlap as the foot print of a meteor ping on two metres is typically only a few km.

Microwave Activity

There has been a bit of talk in relation to rain scatter (RS) modes. Steve ZL1TPH has got keen and mounted one of his 10 GHz transverters up the mast in preparation for some bad weather. Steve and Simon ZL1SWW decided to do a benchmark test on 10 GHz to check if the path was viable in non RS conditions. Now this path is non line of sight (NLOS) with Steve being at near sea level and Simon at 57 m ASL behind a cliff edge and Rangitoto Island as well. Suffice to say, we established contact with up to S5 levels for a short time and then boom! Near to nothing and signals just perceptible in the noise. We decided that we must have had some Aircraft Enhancement (AE). Interestingly enough, the VK logger has put up added functionality. Please see <http://www.vklogger.com/forum/viewtopic.php?f=64&t=10638> or go straight to <http://www.flightradar24.com/>.

Kevin ZL1UJG outlines some activity in relation to RS. "As I arrived home tonight Stephen alerted me that conditions could be favourable for rain scatter tests between Orewa and Hamilton (A very obstructed path where signals are barely above the noise on 1.3 GHz).

Stephen had his setup, (which Stephen will explain later on) while at this end, an old 10 GHz G3WDG transverter (~300 mW out) and G4DDK004 LO was used (kit built by Tom ZL1THG). This was fed via about 1m of LDF2-50 into an old 60 cm dish (2.4 GHz type). The dish was just inside the garage roller door, with the equipment set up on a cheap workmate behind it

After some minutes of tuning around, Stephens beaconing signal was located some 30 kHz lower than expected. (both ends are non-synthesized transverters.) The signal received in Hamilton was about 6 to 10 dB above the noise for several minutes with a mushy warbly sound, but as further rain went through the path, the signal disappeared into the noise, and was not found despite another hour of further intermittent testing."

Steve ZL1TPH has opted to make up a more portable 3.4 GHz setup using a surplus 600mm 0.2 FD dish. This dish is quite deep in regard to what we normally see. It was

Steve ZL1TPH's modified dish feed for 3.4 GHz.

The FE-5680a Rubidium Standard.

originally on 18 GHz so the feed point was not really usable for much apart from a support for another feed system. Steve made up a nice feed point using a loop and a splasher plate. The Tef on standoff was used to anchor the new 3.4 GHz loop. He says that performance is good and the gain attained in relation to size is good so has advantages of not having to lug the 1.3 m dish around for a quick contact.

Other Technical

The scribe and a small party of others have been playing around with the FE-5680a Rubidium frequency standards. A number of us also have the HP Z3815 GPS Disciplined Oscillators (GPSDO) that also output 10 MHz frequency standard. These are extremely accurate after a long (3 days) period. To get the two units as close to each other as possible, we have used a high speed version of the CD4046 PLL chip with the phase comparator to measure the discrepancy between the two units. The beauty of the Rubidium unit is that you get a pretty accurate standard after a relatively short start-up time. It was noted that the oscillators in both units take longer to warm up on very cold nights! The phase comparator feeds a meter via a small low pass filter. The speed of meter excursions from zero to FSD gives an idea of the difference. A well set up unit will have an excursion of over several hours.

There are several websites dedicated to these units and a quick Google search on FE-5680 will reveal many useful details.

The Rubidium units do not have such good phase noise so hence aren't really suitable to directly drive PLL references for microwave transverters. You can, however, use the Rubidium to drive another oscillator that is phase locked.

Other Matters

John ZL1JD is asking for submissions in regard to the Technology Convention at Easter 2013. Planning for the Technology Convention to be held at the Western Springs Garden Community Hall, Auckland, during March 30 and 31 (Easter) 2013, is well under way. The time has come to call for papers for presentation at this convention.

At this stage, a brief synopsis of no more than two paragraphs (approximately 150 words) about the proposed subject is required. The subject content should be about developing technology in communications, be it voice, data, control technology, or anything relevant to modern electronic communication techniques.

Synopsis can be sent by Email to <conventionpapers@aucklandvhfgroup.org.nz> no later than September 30 2012.

Note: Not all synopses received may be accepted for the convention. This will be decided by the number received and how much time is available through the Easter weekend, and the relevance of the subject proposed. A more detailed proposal of the presentation could also be required at the beginning of November 2012 for the purposes of allocating time slots during the Easter weekend and planning of facilities.

2012 VHF-UHF-SHF Contest Calendar

Brass Monkey Contest. All bands 50 MHz and up. On Saturday the 4 and Sunday the 5 of August 2012.

Microwave Contest. All bands 614 MHz and up. (6 and 7 October)

Field Day Contest. All bands 50 MHz and up. (1 and 2 December)

For all contests, the operating periods are 1700 to 2300 on the Saturday, and 0700 to 1300 on the Sunday, NZ local time. The Contest Rules are available at: <www.vhf.org.nz/VHF-UHF-SHF-ContestRules> . All contest logs should be sent, to arrive within two weeks, to: <zl2wa@clear.net.nz>

Summary

Many thanks go to the contributors who help make this column happen with their input; ZL4LV, ZL1JD and others. If you have input and pictures for the columns ahead; such as DX activity reports, repeater installation, branch activities, snippets of interest, technical items etc, please send to Simon ZL1SWW <zl1sww@nzart.org.nz> or *Call Book* addresses. (I also accept large picture files sent via email).

Day and Time	Frequency	Stations involved	Stations transmitting First Period
Saturday 0600 to 0700	144.330	VK to ZL	ZL
Saturday 0700 to 0800	144.230	VK3/5/7 to VK1/2/4	VK3/5/7
Sunday 0700 to 0800	144.230	VK1/2/3/5/7 to VK4	VK1/2/3/5/7

CALL FOR PAPERS

Technology Convention, Easter, Auckland 2013

Planning for the Technology Convention to be held at the Western Springs Garden Community Hall, Auckland, during March 30 and 31 (Easter) 2013, is well under way. The time has come to call for papers for presentation at this convention.

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Old Timers' Club

Stephen Hayman ZL1TPH
<zl1tph@nzart.org.nz>

Hi, Everyone. In this issue we present the minutes of the OTC Annual General Meeting held at the NZART Conference, Nelson 2012. We wish to thank the Conference organizing Committee, along with the members of Branch 26 Nelson, for their warm hospitality.

We also have a recent change in editorial scribe to the OTC column in *Break-In*. It gives me the greatest pleasure, to thank Roy Symon ZL2KH for his involvement and outstanding contribution as OTC scribe, for over a 14 year period from 1998 to 2012. On behalf of all OTC members and readers, we pass on our sincerest thanks, and wish you all the best for your future endeavours.

Old Timers' Club-OTC (ZL)

- To recognise service to Amateur Radio;
- To revive and maintain interests and good fellowship among the older members in the common cause;
- To offer advice and encouragement to newer Amateurs;
- The Club is affiliated to the New Zealand Association of Radio Transmitters (Inc.)

Grand Old Man; Ivan Horn ZL2ATU. PO Box 7250 Wanganui. E-Mail <loobie@kol.co.nz>

Secretary/ Treasurer; Barry Stewart ZL2RR. 1 Caversham Road, Westmere, Wanganui 4501. E-Mail <ZL2RR@xtra.co.nz>. Phone: 06 - 345 4152

Monday Evening SSB Net. Net details: 2030 hr (local time) each Monday on 3.870 MHz LSB.

Sunday morning AM Net. Net details: Sunday morning at 10.30 am on 3.850 MHz.

Annual General Meeting 2012

Minutes of the Annual General Meeting Held at 0900 on Sunday, 3 June 2012 in the Kotoku Room of the Tahunanui Events Centre, Nelson. Stuart Watchman ZL2TW Chaired the meeting with Jim ZL2BHF as scribe. Stuart opened the meeting and welcomed the 22 present.

Present: ZL2TW Stuart Watchman, ZL2BHF Jim Meachen ZL3GX Alan Chapman ZL3QR Geoff Gilman ZL1LR Peter Anderson ZL1AWA Anne Anderson ZL2BHG Roger Lawson ZL2RP Bob Peters ZL3VP Gareth Bradshaw ZL2AZ Peter Lake ZL4PN Brian Skeet ZL1FS Stephen Miller ZL1MG Ted Bretherton ZL3MEM Maurice McNab ZL4AE Bill Olsen ZL1TGC Vaughan Henderson ZL1TPH Stephen Hayman ZL1TAJ Neill Ellis ZL3ADF John Hirtzel ZL1AUW Alan Wooller ZL1BNB Mike Newman ZL3IB John Walker.

Apologies: ZL2KH Roy Symon, ZL2ATU Ivan Horn, ZL1AUI Bob Banks, ZL2LDX Don Lauder, ZL2AUB Pete Moore, ZL2AKW Trevor King, ZL1ALK Celia Reed, ZL3CK Martyn Seay, ZL1TF Iain Morrison, ZL1ABR Barry Ward, ZL1BDY John Seakins, ZL2AOH Ralph Sutton, ZL2ADL Brian Purdie, ZL1GE Eric Manning, ZL1IE Brian Heywood, ZL2BEF Paul London, ZL2JM Joe Morrison, ZL1AJM Jim Morgan, ZL1CYK Derek Stansfield, ZL2ALJ Tony Fletcher, ZL3SZ Don Dalrymple, ZL1KL Gordon Cooper, ZL3HB Rory Deans, ZL4AG Ralph Boshier, ZL1PZ Ian Sexton, ZL2AFT Bryan Anderson, ZL1RK Rod Radford, ZL3LI John Neal, ZL4OZ Dave Adams, ZL1BRY Hector Anderson, ZL3MJS Mike Stubberfield.

Silent Keys

Members stood for a period of silence in memory of those who had become Silent Keys.

Minutes

The Minutes of the 2011 Annual General Meeting were read and confirmed. Moved Bill ZL4AE, Seconded Peter ZL1LR. Carried.

Business arising out of the Minutes; Nil.

Annual Reports

The Secretary/Treasurer's Annual Report and Financial Statement were circulated and taken as read. They were adopted. Stuart ZL2TW/ Gareth ZL3VP. Carried.

OTC AGM Nelson, Jim ZL2BHF and Stuart ZL2TW.

Election of Officers

Grand Old Man: Ivan Horn ZL2ATU was reappointed.

Secretary / Treasurer: Two nominations were received for this position. Anne Anderson ZL1AWA, nominated by George Boorer ZL3PN and seconded by Arthur Welford ZL3GE, and Barry Stewart ZL2RR, nominated by Ivan Horn ZL2ATU and seconded by Stuart Watchman ZL2TW.

The results of an earlier email vote of OTC members plus a paper vote held at this meeting resulted in Barry Stewart ZL2RR being declared the new Secretary/Treasurer of OTC.

SSB Net Controllers

Roy Symon ZL2KH
Don Dalrymple ZL3SZ
Stuart Watchman ZL2TW
Pete Moore ZL2AUB
Ivan Horn ZL2ATU

AM Net Controller:
Doug Alexander ZL2AWF

District Representatives

ZL1: Stephen Miller ZL1FS was appointed the ZL1 District Representative with the current representatives for ZL2, ZL3, and ZL4 as below being reappointed.
ZL2: Stuart Watchman ZL2TW
ZL3: Don Dalrymple ZL3SZ
ZL4: Peter Anderson ZL1LR

Scribe for OTC Column, *Break-In*

Roy Symon ZL2KH was not available for reappointment to this position and as no nominations had been received for this position it remains TBA.

Presentation of Montgomery Cup

For best article in *Break-In* by an OTC member during the preceding year; It was Moved: Peter ZL1LR, Seconded Stephen ZL1FS that " the Montgomery Cup be awarded to Roy Symon ZL2KH for his services to the OTC Column in *Break-In* for over a decade" this motion was carried by acclamation.

The Next OTC AGM

The next AGM of OTC is to be held on the Sunday of Queen's Birthday Weekend 2013.

General Business

The Time of the OTC Net on a Monday Evenings; John ZL3ADF expressed the view that with current HF conditions 8.30 pm was not a very good time for stations in the South. After a little discussion it was suggested that an email poll be taken to ascertain as to the best time for nets and whether they should be weekly or daily. A hat was provided for a collection for funds. The Meeting Closed at 0945 hours.

Stuart ZL2TW reports

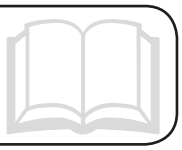
Our new OTC *Break-In* scribe, Stephen, ZL1TPH was keen to hear how I came to chair the OTC AGM at Nelson. Roy ZL2KH as secretary /treasurer has acted as scribe at the OTC AGMs with the local district representatives chairing the meetings. With Roy stepping down from the position and having a break from conference this year Jim ZL2BHF was asked by Roy to act as scribe at the AGM this year in the interim until a new secretary was appointed. As the second district representative I chaired the meeting.

My introduction to an OTC AGM was at the Blenheim conference in 2004 which was chaired by Bob ZL1AUI with Roy as secretary. I was most impressed by the efficient no-nonsense nature of the meeting, something I have tried to adopt when chairing meetings, both hobby related and professional!

Roy has held the position of

Magazine Survey

Compiled by Grahame Fraser ZL3SJ
<grahame.fraser@canterbury.ac.nz>



Amateur Radio (WIA)
May 2012

p6 A look at frequency synthesizers
p11 The effects of a metal mast or a (very) stupid mistake! (For many years dipole and loop antennas had been "interacting very adversely" with their metal mast)
p12 Microwave dishes, a conf uence and two bottles of red wine (field day operation with six transverters from a spot where four Maidenhead grids meet)
p14 Test patterns for ATV
p28 A valve receiver that runs from 12 volts
p44 A BPSK bandpass filter
p52 On sporadic E VHF propagation and solving a mystery about maximum usable frequencies – Part 2

June 2012

p6 Foundation Corner 20 – A buzzer with a difference (continuity tester for cables and connectors, not electronic circuits)
p30 An unlikely source of QRM or your HF or VHF station. (Instability when LEDs connected to a power supply for halogen down lights)
p33 A computer powered multimode transmitter - QRP from your computer's USB port.
p60 An isolated USB interface for controlling radio equipment.

CQ Amateur Radio
May 2012

p22 The Extraordinary Solar Cycle 19: Memories of One Who Lived It
p26 Hamming on the High Seas: MM on Cruise Ships
p38 A Wideband Field Strength Meter (10 kHz to 1 GHz)
p65 Making a Quarter-Wave Antenna Really Work

July 2012

p13 The ON4WW Ultimate Beverage Switchbox
p36 How Accurate is Your Test Equipment ?
p62 Kit-building: A Pair of CW Filter Kits
p69 The Young People are There: If They Build it They Will Learn

QST
June 2012

p30 The 43-Foot Vertical Monopole – What's the Magic ?
p32 Build a Portable Mount for Your PV Panels
p36 A Cooler Battery Box with a Digital Meter
p39 An Easy to Build Rear Mount 2 Meter Yagi
p41 A Spice Bottle Logic Probe
p44 A 160 and 75/80 Meter Folded Monopole
p49 A Look at Gasoline Powered Inverter Generators
p60 Hands-On Radio #113 Radiation Patterns
p62 Keeping your Station Computer Clean
p96 The Society of Wireless Pioneers (ship operators) (their "Sparks Journal" archived at www.silentkeyhq.com and www.californiahistoricalradio.com)

July 2012

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secretary and *Break-In* scribe since the Auckland AGM in 2001; Roy's close friend Brian ZL2AJS took over as Treasurer at the same time. Sadly Brian became silent key too early in 2003 and Roy took over the treasurer role. Roy has also faithfully kept the records for OTC, organised the net schedule, circulated e-mail news as well as taking his turn as net controller. Roy's contribution to the running of the OTC over the last decade has been substantial and I know all members of the club are very grateful for this.

I had my first eyeball with Roy at the Masterton conference in 2003, and I discussed with him my approaching 25th anniversary of being a ham and my eligibility to join OTC. Roy made sure that as soon as I was able I was signed up as a member. (It was at the Masterton conference Saturday evening dinner when Roy commandeered a microphone and told one of the funniest jokes I have heard, and he got away with it!) I soon joined in the 40 m Sunday morning net which later move to its current spot at 3870 on Mondays. Having put up my hand to help as a net controller I was soon made a second district representative hence my chairing the Nelson meeting.

73, *Stuart ZL2TW*

New Members, Silent Keys, Certificates sent out

The new Secretary has nothing to report, except to say that changeover has taken place, and the next certificates are due to be issued late September, last for the year.

OTC Members input

We await further contribution, for the next OTC column in *Break-In*.

Amateur of the Year 2012

The Wanganui River City Press newspaper reports a local licenced radio operator has won a National award. Barry Stewart ZL2RR received the award from the National President Vaughan Henderson ZL1TGC in Wanganui this week.

Barry was named 'Amateur of the Year'. The decision to make the award to him was taken early this year at the annual conference in Nelson of the New Zealand Association of Radio Transmitters. The award is made annually to one radio ham and Barry is the second member of the Wanganui club to receive it.

Barry was nominated for the award of his meritorious service over many years to the national QSL bureau. Barry also received a letter from the MP of Wanganui congratulating him on being named 'Amateur of the year 2012', Congratulations!

Acknowledgements

Many thanks go to the contributors who help make this column happen with their input: ZL2STR, ZL2KH, ZL2ATU, ZL2RR, ZL2TW, ZL2BHF, and others.

Summary

The OTC column is a forum for members to publish a letter, or an article. OTC readers, along with association members, will all enjoy reading and hearing about other radio amateurs experiences, both past and current.

Contributions can be technical, an account of first involvement with early amateur radio, nostalgia, along with vintage radio which all provides an invaluable source of information on the history of their hobby.

The "Old Timers Club" was essentially a social organisation, and that is still current today.

Articles relating to all aspects of OTC, are most welcome, and to be addressed to: Stephen Hayman ZL1TPH; Postal address, 68 Kath Hopper Drive, Orewa, 0931 or via email to <zl1tph@nzart.org.nz> We also accept large picture files sent via email and will transcribe hand written letters to text.

73 *Stephen ZL1TPH*

AREC – Amateaur Radio Emergency Communications

Geoff Gillman ZL3QR and Bev Gillman ZL3OV

AREC Mission Statement:
To be the preferred provider of Emergency Communications to New Zealand Emergency Services.

(An apology. Due to a proof reading error on my part there was a printing error in the April/June issue of Break-In. My sincere apologies to Geoff and Bev and our readers. John ZL3IB editor)

Hi, Everyone. Regrettably, and for reasons beyond our control, the last issue was inadvertently a reprint of the March/ April copy. This means that copy currently held will now appear a little later in the year. We have, however, brought the Activity Briefs up to date by covering the extra two months, but to stay within our allocation, these have been held to strictly "action" events. Now, an update on further NVIS experiments in the Canterbury area.

Since I wrote the last article for *Break-In* on tactical deployment on HF, Canterbury AREC teams have been able to further test the ideas that had been tried for the Kayak Race in December 2011. During the Coast to Coast event in February and the 2012 Canterbury SAREx held in the Lewis Pass at Windy Point at the end of March we were again able to deliberately utilise NVIS techniques for our HF planning and operations.

Coast to Coast 2012

The communications planning for the Coast to Coast very much followed that described in the March/ April 2012 column, with a number of HF stations on shore and two HF equipped jet-boats that roved up and down the river throughout the day.

Checking IPS website[1] propagation predictions caused some surprise because the December kayak race had suggested that 7 MHz operation may have been better than 5 MHz. This time however the T index had fallen noticeably and now 5 MHz was the optimum frequency for most of the day with some concern that we may even have had to use 3.5 MHz in the morning period. It was hoped to avoid dual frequency operation if at all possible – because the changeover between frequencies is often a potential source of operational complications.

At the beginning of the day, two shallow "sloper" antennas were hung from the Gorge Bridge, one on 3.6 MHz and one on 5.320 MHz to establish initial communications with the teams as they deployed. As it turned out it was possible to conduct all operations on 5 MHz although a separate listening watch was maintained on 3.6 MHz throughout the day.

The team at Gorge Bridge also trialled an Ethernet based separation kit for an IC-706. This kit allowed the 706 radio head and RF body to be separated using an Ethernet wireless access link, so that we could control it from the vehicle but actually have the transmitter and its antenna several hundred metres away. At the transmitter location we installed a 5MHz f at-top dipole at approximately 2.5 m above ground level fed with an AH4 tuner.

In the jet boats considerable effort was undertaken to install at least two ground radials to improve the operation of the HF whip antennas. One of the boats used an antenna tuner and one did not. Both boats had the whips tilted over to improve radiation in the upward direction.

The shore stations were asked to as far as possible install their antennas in a manner consistent with the NVIS approach we were attempting to use. In some cases, this was accomplished with f at top low height dipoles (with and without tuners), in other cases by simply lowering the "inverted vee" antennas as far as possible and raising the ends within the physical limitations of the site itself.

Overall the results for this event showed a significant improvement in our ability to maintain communications during the operating period.

- All shore stations had good signals between each other and the base stations at Mt White and Gorge Bridge for the entire period.
- The remote flat-top dipole outperformed the "sloper" antennas at the bridge by several S points for the whole day.
- The boat with the tuner and ground wires was consistently better than the boat without tuner and ground wires
- We could always hear both jet-boats, but the one with the tuner and better ground system was consistently 1 or 2 S points better in signal strength
- The predicted operating frequency (5MHz) performed extremely well – reinforcing the value of checking propagation predictions and watching the trends prior to the event.
- Our Sumner station was able to monitor almost all of the HF communications throughout the day – previously they had found that the HF signals were difficult to copy during the early afternoon.

Although we still used a large component of VHF and UHF communications, an error installing one of the STSP repeaters meant that we could not access one of the links from Gorge Bridge as planned. This repeater normally formed a primary part of the communications, but in this case the HF communications were good enough that the problem with the repeater was not an issue (apart from taking steps to avoid the problem next year ☺).

Canterbury SAREx 2012

The Canterbury regional SAREx for 2012 was held at Windy Point in the Lewis Pass. The event this year was run as a series of round robins. Three cohorts of between five and six teams moved between three different locations – each location having a different training focus. Communications were managed using a mixture of simplex VHF (communications between teams within a cohort) and VHF portable repeater on ESX-59 (communications for 'management' and between cohorts).

Apart from managing the radio traffic between the Incident Control Point and the teams, the AREC exercise focus was to test the viability of town base communications using NVIS and to trial email over HF radio using the Winlink RMS Express software. If successful it was hoped that Winlink would provide "another tool in the box" for establishing links to the nearest major population centre.

Around the country most SAR regions have available satellite internet kits and the various groups have come to use these very effectively. In Canterbury we have found that we cannot always 'see' the part of the sky where the satellite is located because of the low angle above the horizon (17°) and the very prominent profile of the Southern Alps on the skyline especially for events that are close to the Alps. At Windy point we were (just) able to establish the satellite link (through a small gap in the ridgeline) and this provided a good full time phone and internet access for the exercise.

The information from US military and other sources claims NVIS coverage using 100 W transmitters over a radius that can extend to 300 to 500 km. This is based on an average ionosphere height of around 220km, and an antenna -3dB aperture of approximately ±50°. On this basis the path from Windy Point to Christchurch fell comfortably within this criterion. Erecting the antennas at Windy Point to deliberately favour NVIS operation provided consistent HF communications to two town bases in Christchurch almost continuously on 5680 kHz (with only a small window (before 9am local time) on Sunday morning where the MUF[2] was below 5 MHz).

At the SAREx the section also trialled the uses of Winlink e-mail software (RMS Express client software). In Christchurch a site using Winlinks "RMS Server" software was established to provide a temporary HF to Internet gateway in Christchurch on 5320 kHz. This proved extremely successful with emails exchanged every hour or so to and from Christchurch during the operational hours.

For those with an interest in HF based email, I recommend the www.winlink.org site as a good starting point. The RMS Express client software is freely downloadable, and can be used to access a number of 'publically' available amateur gateway sites around the world (several in Australia and a couple in NZ) to exchange email to any email address. Winlink drew my attention after I found that it had been used quite extensively in the aftermath of the Katrina disaster in the US. There are a number of other systems also available but the Winlink system offered the option of quickly and easily establishing an EmCom (Emergency Communications) gateway on a frequency that suited us for a short term operations – in this case 5320 kHz.

Of course, HF based email is not fast, in fact with a reasonable

circuit, expect no more than about 500 bytes/minute. Peak rates can be higher (2000 bytes/minute) but the average is around 500 bytes/minute. Even so, 500 bytes/minute can transfer quite a long text message much faster than voice and if there are no other alternatives (cellular or satellite connections) provides a useful alternative to cellular and satellite options. The digital process is quite robust and works well under conditions that would often challenge SSB voice operation.

Email from the Search Incident Control point is very valuable for such things as media releases, logistics requests, updates to senior management and so on. In addition some information is more readily transferred in a digitally based format for example GPS unit GPX files.

With the speed limitations inherent in HF based data transfer, only small attachments can be sent and it is definitely not viable to send pictures or graphics of any form unless extended transmission times are acceptable. However many files (for example data files for GPS and mapping applications that use GPX format) are in fact based on text formats and can be transferred quite easily in this manner.

Since the SAREx, Branch 05 has been continuing tests with Winlink, and has been operating a local gateway on 7 MHz for a few weeks. Also just prior to the SAREx, Renfred, ZL1BDL established a gateway in the North Island on 80m which is quite accessible during the evening from Christchurch.

The on-going tests have proved successful with connections using mobile HF installations[3] in the middle of the day at distances varying from 10 to 350 km. The equipment required is quite modest,

- HF Radio able to operate in a "soundcard mode", any Icom IC706, Yaesu FT817, 857, 897 or similar radios
- An audio and PTT interface to connect the computer to the radio (I use a homebuilt interface with two audio transformers and an opto-coupler)
- Small computer (laptop) with average soundcard

The Winlink organisation also has available software to support VHF or UHF AX25 protocol packet gateways[4] which have been trialled successfully. These allow direct integration into a standard mail client such as Microsoft Outlook or Mozilla Thunderbird and of course have a greater speed of data transfer. I believe that these can be useful in providing email access in locations which are just out of the cellular coverage, but within either direct simplex VHF range of a gateway or accessible via a digipeater.

I wish to acknowledge the assistance of Rob Thirkettle, ZL3RX, in establishing gateway stations for RMS Express and WinPac on both HF and VHF so that the tests described above could be conducted.

Richard Smart ZL4FZ/ZK9EA

[1] <www.ips.gov.au HF Systems – LAMP> (Local Area Mobile Predictions)

[2] Maximum Useable Frequency. The Australian Government Ionospheric Prediction Service refers to this frequency as $f_o f_2$

[3] 50 W pep into a 2 m (6') mobile HF whip (FT857D with homebrew interface)

[4] WinPac; software to integrate an AX25 TNC to standard email client software. This is available from the <winlink.org ftp> download site

Grape Ride 2012

Marlborough Branch 22 again provided communications for the eighth annual Grape Ride on March 24. The event starts at the Forrest estate winery in Renwick, heads east to SH1 just north of Blenheim, then on to Picton, west to Havelock on the Queen Charlotte Drive, then south back to Forrest estate. The bulk of the 3000 odd entrants complete one lap, some as relay riders and for the keen there is a two lap event starting at 0600, and for the crazy and unsupported, a 5 lap event that starts the afternoon before!

A communications base is located at the start/finish with St John Ambulance event organiser co-sited with a radio to their South comms base in Christchurch. This arrangement is a big help in getting early activation of ambulances to injury accidents and avoiding confusion. The Nelson 720 repeater served as a useful back up for coverage of the Queen Charlotte Drive helping to relieve the Picton 7225 repeater of less important traffic. At base we used the attenuator technique in the coax feed-line to allow several channels to be used simultaneously with no de-sense.

Our operators are located at strategic points around the course and at the relay transitions at Picton and Havelock. We also have operators in the lead official vehicles and the tail end vehicles. The ride experienced by our members varies greatly here: the 'speed bunnies' (elite riders sent off before the main bunch) really chase the lead vehicle around the windy bits yet the extreme tail end vehicle drops almost to a walk at the end of the day.

The event provides our Branch with a bit of a challenge in that about a quarter of the course has poor repeater coverage which we fill in with an STSP. The STSP site has poor coverage back to Blenheim, and various linking techniques have been experimented with each year. We always site an operator in the overlap of the STSP and Blenheim repeater coverage areas to act as a relay in case of a link failure. For 2013 we plan to try a new site above Havelock for our STSP which may solve these problems.

This was the wettest year by far with pretty steady drizzle for the Queen Charlotte leg. There were no more nasty incidents than last year but the first aiders at the finish line reported a lot more minor injuries needing attention ref ecting perhaps more minor spills from the wet. Things were made even more exciting by a diesel leak along the road from Havelock to Linkwater which caused a few prangs. Our operator at Linkwater was able to arrange for a warning sign to be put up which the riders took note of. As usual at times things became quite hectic but prioritising calls allowed things to be worked through.

Thanks to the 21 members of branch 22 that made the support of the event possible, a good effort for a small branch.

Stuart Watchman ZL2TW

Activity Briefs

(A selection from Mar / June.)

1/3/2012. New Plymouth Branch 27. SAR. Mt Egmont/Taranaki. Tramper 2 days overdue on Mt Egmont/Taranaki, intended to round the mountain track. After several hours of searching by 2 helicopters and 9 teams a phone call was received after a newspaper article was printed advising the overdue male at gone to stay with someone he had met and never though to advise the Accommodation Lodge he had been staying at.

2/3/2012. Tauranga ECG Branch 88. SAR. Waitao Road, Welcome Bay, Tauranga. Five hunters phoned 111 and advised they had walked off the track and been walking for hours and had become lost due to the heavy rain and wind. Briefing meeting held at Tauranga South Police station commencing at 20:00 hr. Pre plan established for search and establishing repeater site, starting early the next morning.

3/3/2012. Tauranga ECG Branch 88. SAR. Waitao Road, Welcome Bay, Tauranga.
Search for five hunters reported lost from the previous day with light clothing and Tee shirts in the Waitao Road area, Welcome Bay, Tauranga. Three SAR teams entered bush, Missing party located at 09:15 wet and very cold.

6/3/2012. Eastern BOP Branch 51. SAR. Matata. 21 year old male out in forest trapping; not back on fifth day. Mother concerned, called SAR. Base set up and teams leaving when party found walking home.

23/3/2012. Northland Branch 28. SAR. Whangarei City. Search for missing 90 yr old male from Rest Home. Returned to home in afternoon, search stood down.

25/3/2012. Eastern BOP Branch 51. SAR. Otipi Rd, Motu. 39 year old woman blazing trap line did not return to road end, SAR called evening of day two. Base set up in Whakatane with two teams in field by 7.00, repeater installed with comms on ESB58. Lost party walked out at 9.30. All OK.

31/3/2012. Thames Branch 41. SAR. Kauaeranga Valley, Thames. Five young people overdue on field trip All found. One injured with twisted ankle

1/4/2012. Tauranga ECG Branch 88. SAR. Greerton Suburb of Tauranga. Dementia patient reported missing from local rest home. SAR and AREC personnel briefed and

continued on page 36

continued from page 35

ready to depart to LKP. Advised patient had been located having taken a taxi to a Family member at Paengaroa some 30 km from Tauranga.

1/4/2012. Marlborough Branch 22. SAR. Goulter River area. Lost hunter, found OK in farmer's homestead after vehicle battery went f at, and was walking out.

1/4/2012. Manawatu Branch 20. SAR. Pohangia Valley / end of No. 1 line. Search for hunter over due for 14 hr. Found safe and well.

8/4/2012. Northland Branch 28. SAR. Waipoua Forest, Northland. Search for missing elderly woman off Waipoua Settlement Road. Found safe and well next morning, approx 09:00.

16/4/2012. Eastern BOP Branch 51. SAR. Whakatane. 12 year old boy did not return from skate park at 15.00 on Sunday. Mother called police at 8.00 next morning. LandSAR activated. AREC setting up repeater when called that the boy had been found at stepmother's home.

27/4/2012. Otago Branch 30. SAR. Cedar Farm, Port Chalmers. Search for a male who became lost in the dark while walking his dog. Search teams were deployed using the ESB 58 SAR repeater. The missing party was located safe and well at 21:45.

27/4/2012. Otago Branch 30. SAR. Waldronville, Dunedin. Search for depressed 42 year old male missing since 1900 hr previous day. Missing person located in tree (deceased - 1X) 1 hour into search.

6/5/2012. North Otago Branch 64. SAR. Ahuriri Valley, Twizel. On 6th May a male tramper reported missing at the head of the Ahuriri Valley. First response team carried out night search of area. On 7 and 8 Oamaru search teams continued to search the area. On the 9 more teams were brought in from Wanaka, Dunedin and Central Otago. On the 12 official search wound down with no result. On the 19 another search was carried out and the missing persons body was found in a steep gully.

10/5/2012. Northland Branch 28. SAR. Mt Manaia, Whangarei Heads. A party of 6 missing on Mt Manaia. Located by Police before LandSAR deployed from Police Station.

29/5/2012. Tauranga ECG Branch 88. SAR. Ngamuwahine Lodge. Ten school children failed to return to Ngamwahine Camp from a day trip. Party located 10 km from camp safe and well.

29/5/2012. North Canterbury Branch 68. Rural Fire. Ashley Forest. Fire in logging slash. 1 Forestry unit called to inspect conditions of Permitted Burn. Contractor to maintain overnight vigil. No other action required. AREC supplied comms/logistics for Forestry unit.

3/6/2012. Northland Branch 28. SAR. Whangarei City. Missing elderly male from Avenues area. Found by Police before LandSAR tasked.

10/6/2012. North Canterbury Branch 68. Rural Fire. Ashley Forest. Fire in logging slash in area being cleared for redevelopment. 2 Forestry units called to assist contractor to suppress fires that had exceeded conditions of permit. Contractor to maintain vigil until fires completely burned out. AREC supplied comms/logistics for Forestry units.

16/6/2012. Otago Branch 30. SAR. Silverpeaks Area, Dunedin. Search for handicapped (1M) 24 year old male who had indicated he was going to walk to Christchurch via the back country, beginning with the Silverpeaks which were covered in snow. Missing party walked out at 1700 hr. and knocked on farmhouse door, very cold and wet! Farmer gave him shelter and warmth and contacted the Police who took charge of him.

16/6/2012. Marton Branch 23. SAR. Wanganui City. River Search approx 4 hr, to clear area for missing person. Stood down at 0930 next morning (30 min prior to start) MP found F&W in another town.

Conclusion

Thanks to those who have contributed to this issue. Material for the next one to please be in our hands by 3rd September 2012. Photos, if included. preferably on a separate CD (with captions) mailed directly to us. E-mail pix may be acceptable but will be at the Editor's discretion and must not be embedded in the text. Contact details: <zl3qr@nzart.org.nz> or <zl3ov@nzart.org.nz> or post to 6 Boyd Street, Rangiora 7400, or phone (03) 313 7137.

(N/B. Articles to please be in doc, rtf or txt format. Publisher or pdf we can not use. Thanks.)

Reminder

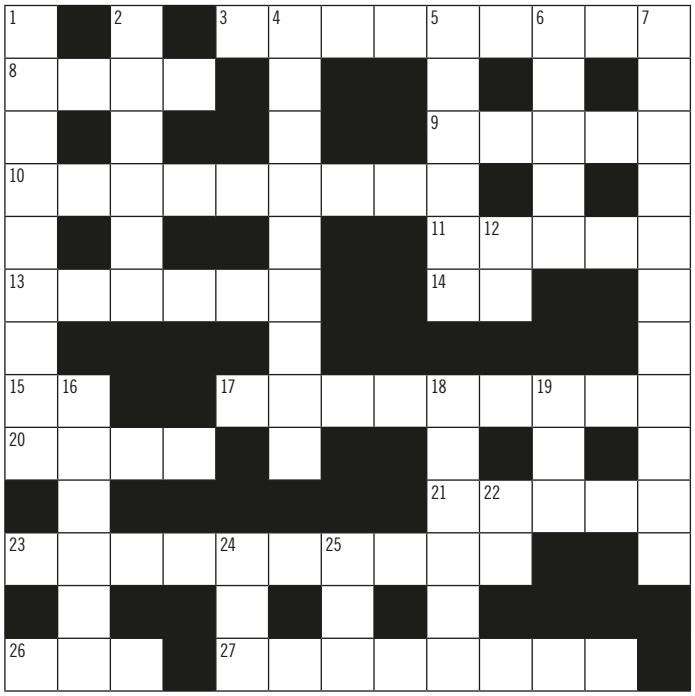
The next Section Leaders Nets should be 20 August and 17 September, 3900 kHz USB at 1930 hr NZST unless notified otherwise.

Until next issue, 73,

Geoff ZL3QR & Bev ZL3OV

ZL Crossword No.17

Compiled by Graeme Hunt ZL1ANH



Across:

3. She helps the magician (9)
8. and 2 down. First ham contact from here to England in 1924 Z4AA to G2SZ (4, 6)
9. Caribbean country, capital Oranjestad P4 (5)
10. Method of transmitting data (9)
11. Odds of 1:1 (5)
13. Element with atomic number 8 (6)
14. Morse for "this is" before own call-sign abbr.(2)
15. Computer/software field abbr (2)
17. ZL3NL, founded a leading mobile radio producing company (5, 4)
20. Type of small satellite (4)_ _ _ _ SAT.
21. Uses radio waves to detect objects (5)
23. Electric insulator that can be polarized, lots inside your radio (10)
26. Method to prevent strong signals overload in a receiver. abbr (3)
27. Listen first, before you do this (9)

Down:

1. Hypothetical antenna (9)
2. See 8 across
4. To prevent unwanted interaction (9)
5. No longer a bitch (6)
6. Angle less than 90° (5)
7. From AT & T Bell labs in 1947 (11)
12. Canada prefix (2)
16. Searching the frequencies (6)
18. Below the feet of every All Black (6)
19. What 3 across does (3)
22. Not direct current. abbr (2)
24. Lotz of voltz in older TVs. abbr (3)
25. Awesome boxer (3)

Answers on p38

SPAM – Society For The Preservation Of Amplitude Modulation

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At the NZART Conference in Nelson this year the incumbent Secretary / Treasurer / Scribe for the "Society for the Preservation of Amplitude Modulation" (SPAM) Roy Symon, ZL2KH, tendered his resignation from all positions. Horrors! What will we do? Roy has been the mainstay of "SPAM" since it's inception and has done an amazing job! I have long stood in awe of Roy's dedication to the different components of the hobby to which he had pledged himself. Apart from the SPAM and OTC offices which he has administered for many years I do know he has been (and continues to be) very active in AREC. Then he took on the monumental task of National President of the Association! How Roy has managed to remain married is beyond me! Roy is most fortunate to have the support of an amazing woman. I have to place on record my personal thanks to Roy Symon for a job very well done. I salute you.

As a result of an Annual General Meeting, very well-chaired SPAM by Jim Meachen ZL2BHF, at Conference I became the SPAM Scribe for *Break-In*. I recall coming away from that meeting thinking "How did that happen? That was not my intention at all".

Well, we can only give it a go! This is my very first attempt at writing a column for any media whatsoever so please be gentle with me if I make any huge bloopers (and I seem to be quite good at that)! The column will generally follow the very successful format which Roy has established over the past few years. Indeed I have some very big boots to fill! It will be a totally "non political" column and I will not enter into any discussions of that nature.

Where do I come from? A very brief biography in terms of Amateur Radio. I got interested in Amateur Radio during my High School years in the early '60's as a result of encouragement from the Head of the Electrical department, Mr. Bill Collett ZL4BP, himself a former National President of the Association. I passed the theory as a 15 year old. I had 12 months to get the CW up to speed, as you had to be 16 years old to get a license in those days. I was up to about 10 wpm when the Post Office introduced the "Technician" ("T" call-sign) grade of Amateur Radio license. Subsequently licensed as ZL4TAB, a call-sign I held for some 35 odd years! (At around 2000 odd I eventually did the 5 wpm CW test and obtained the present call-sign, ZL4AE). After I left high school I worked at a number of occupations and was eventually offered an apprenticeship in the radio industry as a Radio Serviceman. Completed that and after a couple of years went into business, in partnership, in a small business in Dunedin. Got married and remained in business for 7 years until going to work for Group Rentals NZ Ltd (doesn't exist any more) and worked in Dunedin, Gore and Invercargill.

I moved out of the trade in the late '80's and worked in Civil Defence, becoming the Otago Regional Civil Defence Officer. Declared redundant in mid '90's (long story) and went back into the trade, working in various aspects (latterly cellular) until retiring earlier this year.

This month we will begin with a brief introduction from the new Secretary Treasurer, Steve Miller ZL1FS. Following that is a continuation of the excellent work done by Garry Henderson ZLTBH, following on from his very good article in the last issue on jazzing up the ZC1 audio and the on air signal quality and a most interesting contribution from "Jakey" Gould G3JKY/ZL2JKY on a "Voltage Multiplier" PSU for valve transmitters.

Introduction: Steve Miller ZL1FS

At the Nelson Conference this year I picked up two positions: namely Area 1 Rep for OTC, and Secretary / Treasure for the SPAM group. I have spoken to the auditor for Branch 02, Mrs. C. Watson, and she offered to be the auditor for the SPAM group.

It's true that you don't hear a lot of me on the radio, When I'm around home (which is more than the average working man) I'm usually monitoring VHF and the national system. I'm now having to pull finger and get my AM station up and running. This consists of a Trio 9R-59 receiver, and a Heathkit DX-60 transmitter, with a Geloso VFO.

My background. I started into Ham radio in Hamilton back in the late 60's. Yes I knew the late Freddy Martin (1FS). Some of you might remember he called himself "1 Fried Sausage ".Somewhere in the mid 70's I ran a ham radio class for the Tokoroa club when I was living there. I've held the post of Secretary for a club before; I'm currently VP for Branch 02 after a few years in the chair. It is also true that I'm not always at home as I still go to sea from time to time, but only for short durations now. You can contact me via <zl1fs@nzart.org.nz> or phone / txt on 021-02264981.

As time goes by it is getting more difficult to keep the various groups going, but I'm looking forward to a good "active" year! So do keep in touch, and feed us your interesting anecdotes (re radio), so we can all enjoy them.

73's for now *Steve ZL1FS*

More Modulation for A ZC1

After addressing the shortage of audio level in my recently-acquired ZC1 Mk II by use of a higher-output electret microphone, I was still getting poor signal-reports so I started looking into ways of improving this.

I was well-aware of a long-established way of achieving 100% modulation when using the simple choke-coupled constant-current-shared scheme originated by Raymond A Heising, i.e. to insert a dropping-resistor with a bypass capacitor between the point at which modulated-HT is provided, and the final. But this scheme achieves 100% modulation at the expense of carrier power; the PEP is unchanged at best. Given the part that screen-modulation plays in the high-level modulation of a tetrode/pentode final, it seemed to me that increasing the proportion of modulation applied to the screen of the 6V6GT beyond its normal fraction (about 50%) of the plate supply might be useful. This could be achieved by dividing the screen-resistor (R16A in the ZC1 Mk II schematic, 15 kΩ) into two parts, with one part bypassed by a suitable capacitor. This would work, but be cumbersome to experiment with so I soon realised that a direct equivalent could be achieved by simply adding a series RC-combination in parallel with R16A. (All component references are to ZC1 Mk2 circuit diagram.)

Calculation showed that a capacitor of 33nF would always be sufficient (given the 15k resistor at R16A) and a series of experiments showed that the resistor in series with this capacitor should be 15k also. Oscilloscope checks showed that 100% modulation downwards was now achieved, but less than 90% upwards with obvious distortion.

A little thought showed that while the energy stored in the choke on the downward swings will be returned to energise the upswings, the resistive losses in the choke assist downwards modulation peaks but oppose the upswings. The only answer available whilst retaining the basic circuit is to increase the current in the modulator 6V6GT (V4B in the ZC1 schematic) to increase the energy stored in the inductance. The common "AREC" audio modifications have partially addressed this by reducing the cathode-resistor of V4B from 500 to 333 ohms; I found that even more current is required so reduced it further to 270 ohms. This remains within ratings for the 6V6GT; it results in a small increase in total power-consumption but the overall arrangement maintains full carrier-power. Oscilloscope checks

continued on page 38

continued from page 37

show better than 90% upward peaks before obvious distortion occurs; unfortunately the digital sampling artifacts conceal the downwards peaks which show as carrier 'flatlining' clearly on an analogue CRO.

Signal reports have greatly improved!

Historical note: Another of Raymond A. Heising's schemes used a centre-tapped choke in a see-saw configuration, with the final at one end and the modulator at the other and HT-supply to the centre-tap. This offers several advantages, including considerable cancellation of DC-magnetisation in the choke-core, and the modulating tube actively pulling-down at the same point in the audio waveform as the final is seeing maximum voltage and drawing maximum current.

Mr Heising also invented grid-modulation and the diode-modulator, amongst the more than 100 patents granted to him and assigned to his employer Bell Labs.

73 *Gary Henderson ZL2TBH*

A Power Supply for a Valve Transmitter

Valve equipment may seem out of date but it's still a good starting point for anyone who wants to try their hands at home construction. The up side is that valves are far more forgiving than transistors when it comes to reversed or excessive voltages. The down side is that suitable components for valve equipment may be hard to obtain, and of course more care is needed to ensure that the constructor/operator is not damaged by the higher voltages used!

In 1993 my number 2 stepson set off on a round the world trip, but New Zealand seemed so attractive that he took root. The following year, XYL Joyce and I decided to visit him in Auckland as it seemed unlikely that he would have the desire (or the finance) to return to the UK. I took with me a much modified CO-PA Tx that I originally built when I was VS6DN in Hong Kong in 1956-57. The Rx was a superhet using six of the DK91 series of battery valves; the HT, about 90 V, was "stolen" from a grid dip oscillator which also did service as an absorption wavemeter to make sure I was radiating on the right band!

For an aerial I took a 7 MHz dipole which was made for the RSGB 1966 Field Day. The only thing missing was an HT supply for the 6AG7-807 Tx. I assumed that I would be able to find an old broadcast Rx which I could cannibalise for the necessary components. How wrong I was! After several visits to second hand shops I concluded that all the valve BC sets in NZ were either still in use or had gone straight to land-fill, so something would have to be built from scratch.

Dick Smith® didn't stock any transformers giving more than 35 V so a voltage multiplier seemed the way to go. Doublers seem to be fairly common in linear amplifiers and multipliers were used for EHT in TV sets. I settled on a transformer with several secondaries, (part number M-6676, probably obsolete by now) and bought enough diodes, capacitors and resistors to make up the circuit shown in Figure 1. Incidentally, if anyone still has one of these transformers it's worth noting that the 0-7 V, 0-17.5 V and 0-10-17.5 V secondary's are all separate, not interconnected, as shown on the box.

The diodes were all 1N4007s but any 1A diode with a PIV of 200V or more would do. The capacitors were all 1000 µF, 64 V working. It was necessary to use C2-C9 in pairs because higher voltage components were not available. The resistors, R1-R9 were all 27 kΩ 0.25 W and were fitted to ensure that the voltage was shared equally between the two capacitors in each pair.

The multiplier works as follows:- On the first positive half-cycle from the transformer secondary, D1 conducts and C1 charges to about 50 V. On the following negative half-cycle, D2 conducts and charges C2 and C3 to 50 V each, as the voltage across C1 is added to the peak voltage from the transformer. On the next positive half-cycle, D3 conducts to charge C4 and C5, while D1 conducts to maintain the voltage on C1. Thus 150 V DC appears across the capacitor chain C1, C2, and C3. The same action occurs with the remaining components, giving 250 V across the whole left-hand chain. This principle could be extended to give higher voltages, the limiting factor being the insulation between the components and ground. On a

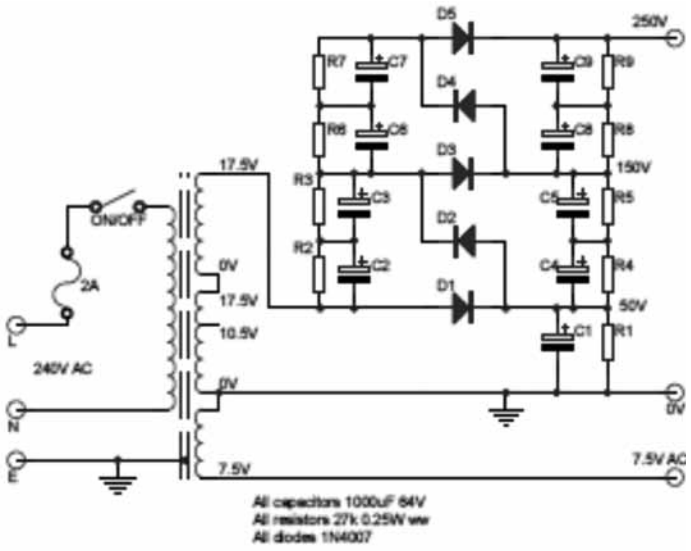

Figure 1. Circuit of HT power supply.

recent test, the circuit supplied 260 V off load, 238 V at 50 mA and 220 V at 100 mA. The 7.5 V secondary was used to supply the valve heaters, via some very thin wires which reduced the voltage to something like 6.3 V.

Using the CO-PA (crystal oscillator-power amplifier) rig at about 10 W DC input to the PA, and the dipole strung as an inverted Vee from a 5 metre pole lashed to the car-port, G3JKY/ZL worked as far as Japan and Massachusetts as well as making plenty of CW contacts around ZL and VK. One nice contact was with a VK named Tim who appeared in my "International" logbook only about 10 pages and 37 years back! The book is still in ZL, so I can't remember his call after all this time!

Before we left ZL to go on to Illinois I bought an identical transformer to cope with the 110 V mains there. At W9/G3JKY, I connected the transformer primaries in parallel and the secondaries in series to give almost the same output as I had in ZL. One W2 asked me "what country is G?" I wasn't aware that we were approaching rare country status!

"Jakey" Gould G3JKY/ZL2JKY
<g3jky@btinternet.com>

New Members

Name	*City/Town*	*Branch*	*Call-sign*
M G Hudson	Tauranga	53	ZL1MIC
R P McCall	Alexandra	61	ZL4HSV
I Lester	Christchurch	5	ZL2GBL
G Hardgood	Masterton	46	ZL2GCH
D C Williams	Whangarei	28	ZL1SKY
S Keesing	Auckland	2	ZL1FN
A J Brill	Auckland	29	ZL1COP
N Marinko	Auckland	2	ZL1WJ
B Jochle-Rings	Christchurch	5	ZL3BJR
F Meyer	Papakura	65	ZL1FJA
E R Richards	Auckland	2	ZL1ERI
R E Harkness	Wellington	74	ZL2REES
J I Stockley	Hastings	13	ZL2LLS
L Baird	Alexandra	61	ZL4DJ

Answers to crossword #17 (p36)

Across: 3 assistant, 8 Shag, 9 Aruba, 10 telemetry, 11 evens, 13 oxygen,14 de, 15 it, 17 Angus Tait, 20 cube, 21 radar, 23 dielectric, 26 agc, 27 transmit.

Down: 1 isotropic, 2 valley, 4 screening, 5 spayed, 6 acute, 7 transistors, 12 ve, 16 tuning, 18 sprigs, 19 aid, 22 AC, 24 EHT, 25 Tua

FMTAG – Frequency Management and Technical Advisory Group

Secretary: Doug Ingham ZL2TAR
<fmtag@nzart.org.nz>

MED becomes MOBIE

As of the 1st of July, the MED became part of a larger Government Department, the Ministry of Business, Innovation and Employment (MOBIE). Radio Spectrum Management (RSM), the section of MOBIE that NZART deals with, remains largely unaffected, for now.

Spectrum Matters

At the conclusion of the 2012 NZART Annual General Meeting in Nelson, Terry ZL4TAE, gave a brief talk about various changes in the radio spectrum, apart from those arising from the World Radio Conference 2012, in Geneva, covered by Don ZL2TLL. The following is a summary of the talk, updated for developments that have occurred since Conference.

UHF TV channel re-stacking and next generation mobile radio

One remit supported Amateur access to a UHF TV channel. Negotiations with RSM are being led by NZART's Administration Liaison Officer, Don ZL2TLL, supported by engineering calculations (co-channel and adjacent-channel compatibility) provided by FMTAG.

The choice of an Amateur channel is affected by the 're-stacking' of the UHF TV Broadcast channels, to release the spectrum between 694 and 806 MHz for Next Generation Mobile Radio. At any given transmitting site, the analogue UHF TV channels were 32 MHz apart, whereas the new digital UHF TV channels are 16 MHz apart, to reduce the amount of spectrum used by UHF TV.

There are many competing interests for the 694 to 806 MHz spectrum, some based on North American, and some based on European, technology. RSM will auction the Management Rights for this spectrum.

VHF TV channels closing down

Similarly, there are many competing interests for re-use of the 54 to 68 MHz and 174 to 230 MHz spectrum, once the analogue TV transmitters currently using this spectrum, progressively close down.

One possible use for 174 to 230 MHz is Digital Audio Broadcasting (DAB). However, analogue FM broadcasting, on 88 to 108 MHz is likely to continue for the foreseeable future.

RSM fees review

A fees review is likely to be conducted in 2013-2014. At present the NZ Amateur Service is greatly favoured with fees of around $51 per repeater licence, compared with $250 to $500 for most other licences in the Fixed, Land Mobile and Marine bands.

NZART will be actively working with RSM during the review, since RSM's revenue income will decline with the impending closure of the analogue TV broadcast transmitters.

General User Radio Licence (GURL) costs

Another area causing concern to RSM is the large mismatch between the (zero) income from low power device GURL's and the significant cost of administering them. In effect, licence holders are subsidising the cost of administering GURL's, which are often the source of Radio Frequency Interference (RFI) to those licensed services, such as our 70 cm band.

Radio and Electronics Training

Since the demise of the Technicians Certification Authority, all formal training in Radio related subjects, such as the RTC and NZCE courses, from the likes of CIT, ATI and the Technical Correspondence Institute, has ceased.

ETITO is working up a new Telecommunications framework and training might be available in the future.

Some organisations, such as Defence, Kordia and Tait Electronics are doing in-house training. Radio dealers in NZ are also looking at developing training for Installers.

Thank you for your attention.

FMTAG email address

FMTAG has only one email address: <fmtag@nzart.org.nz>

Please use this email ref ector address, so that all FMTAG members receive a copy of your message, and can cover for FMTAG members temporarily out of email contact.

Also, when replying to messages from FMTAG, please click on "Reply All", instead of "Reply", for the same reason.

NZART Council revises its licence fee policy

As mentioned in "From the President" (page 3 May/June *Break-In*), NZART Council has revised its Beacon, Link and Repeater Licence Fee Policy. Here are more details.

Council resolved to encourage the transfer of Repeater, Beacon and Link Licences from NZART to the equipment-owning Branches, and to impose a surcharge of $5.11 per licence, to offset NZART HQ costs, for those licences that remain with NZART.

Branches wishing to avoid paying the $5.11 surcharge for each licence need to request transfer of their licences from NZART to the Branch. To start the licence transfer process, please send an email to FMTAG to receive a customised information pack: <fmtag@nzart.org.nz>

NZART Council has confirmed that the revised policy does not apply to National System or International Beacon Licences.

As at the 10 of July, the following Branches (and Affiliated groups) had not started the licence transfer process, or had advised that they wish to stay with the present fees arrangement:

05 Christchurch
26 Nelson
28 Whangarei
33 Rotorua
34 South Canterbury
37 Southland
38 Taumarunui
42 Titahi Bay
48 Wanganui
49 Westland
51 Eastern Bay of Plenty
55 Waitomo
56 Christchurch West
66 Auckland VHF
67 Kawerau
78 Far North
82 Southern Wairarapa
84 Bay of Islands
85 Mercury Bay
87 South Taranaki
CARDS

Proposals

None this time

Final recommendation to NZART Council

Branch 18 Hutt Valley has applied for a power increase of its 700 repeater at Fitzherbert, located at TOPO50 BQ32 644 351. An engineering investigation, in accordance with MED PIB38, confirms that there will be no interference to other stations, and that the repeater transmit frequency can remain on 147.000 MHz and its receive frequency on 146.400 MHz.

NZART Council approvals

NZART Council approved the following Final Recommendation at its June 2012 meeting:

Branch 24 Motueka application for a power increase of its 670 repeater at Mount Campbell, located at TOPO50 BP24 876.19 474.92. The repeater transmit frequency is 146.700 MHz and its receive frequency is 146.100 MHz.

Comments and Applications

Please send your comments and suggestions on the above matters, and on any other FMTAG matters, by e-mail to: <fmtag@nzart.org.nz>

Applications for repeaters, beacons, digipeaters, point-to-point links, and so on, should be made on the latest version of FMTAG Form 10. The latest versions of FMTAG Form 10, and the explanatory Form 10A, are available on the NZART website: <http://www.nzart.org.nz/fmtag/index.html>

Completed forms should be sent by e-mail to <fmtag@nzart.org.nz>

Contributions to Break-In

Break-In is a forum for NZART member's amateur radio projects, experiences, opinions and news. Your contributions and feedback is welcomed. Contact the Editor John Walker ZL3IB at <john.zl3ib@ihug.co.nz>

WARO – nz womens amateur radio operators

with Topsy ZL2LS, Sharon ZL2BQ and Ngaire ZL2UJT
<waro@nzart.org.nz>

Conference has come and gone for another year. How nice it was to see so many of you there and finally put a face to some of the names we hear and chat to on the radio.

It was great to see many of the WARO members attending the alternative program on both days, this giving you a great opportunity to enjoy the company of other members, and also XYLs attending Conference. This is always a good opportunity to catch up with old friends and make some new ones.

The WARO AGM was held on the Sunday am and was well attended this year with 12 members. Vaughan ZL1TGC President of NZART and Stephen Hayman ZL1TPH also called in on our AGM; this was good to see them there and we voiced a few concerns of WARO members.

Continuous Membership Awards

30 Year Certificates:
Laureen Tubby ZL1BTP No 37
Carol Gaudin ZL2VQ No 38

40 Year Certificates
Carol Dewar ZL1AJL No 12

Elected Officers 2012 / 2013

President: Margaret Bretherton ZL1MB <tedmarg@clear.net.nz>
Vice President: Kathy Purdie ZL2ADK <purds@inspire.net.nz>
Secretary: Lynette McDonald ZL1LL <lynnette.mcdonald@xtra.co.nz>
Treasurer: Heather Scott ZL2TYF <secretary@ nelson carclub.co.nz>
Committee: Marlene Mathews ZL-1MYL and Bev Gillman ZL3OV

Appointments

Awards Manager:
Lynette McDonald ZL1LL
Contest Manager:
Bev Osborne ZL1OS
Sponsorship Secretary:
Ceila Reed ZL1ALK
Librarian / Archivist:
Joline Beale ZL1UJB
Break-In Columnist:
Ngaire Jury ZL2UJT and Topsy Scott ZL2LS
Bulletin Editor:
Bev Osborne ZL1OS
Official Broadcast Co-Ordinator:
Rosemary Boshier ZL1RO

New Officers for 2012/2013; Heather Scott ZL2TYF replaces Janet Musto ZL1JAN as treasurer. Thank you Janet for all you have done as treasurer during your time on the WARO executive.

Sharon ZL2BQ has resigned from being one of the *Break-In* Columnists, due to comments made by the editor to her. Thank you Sharon for all the articles you did for *Break-In*

NZ WARO Achievement Award 2012

WARO's Executive endorsed the nomination of Bev Gillman ZL3OV to be awarded the NZ WARO Achievement Award. Bev joined WARO as an Associate member in 1983, when we had up to 30 associates. She continued in this capacity until 1991 when she and several other Canterbury YLs passed the amateur exam. Her call-sign was ZL3TCR until 2003 when licence conditions changed and she became ZL3OV. Bev has been an active amateur over the years and attended NZART Conferences when she was able to. She arranged meetings of YLs in her area and was always supportive of her local amateurs. She was elected as a WARO Committee member in 1999 and she has represented the ZL3 area since that time as a regular on the Exec net. She has taken part in WARO Contests and Awards over many years and is one of our 80m net controllers. Her involvement with the Awards Net has kept her active on 80m and she is a controller of that net once or twice a week. Her support of AREC is shown as a co-writer of the *Break-In* AREC column with OM Geoff ZL3QR. They were active on air in the early days after the Christchurch earthquake.

Bev has been a willing worker and supporter of WARO in spite of ill health, and is a worthy recipient of this Award. Congratulations Bev.

YL International Meet 2012 in Adelaide

New Zealand was represented at this Meet by Biny ZL2AZY and Mervyn ZL2AVY, Sharron ZL3AE and Glenn ZL3GL and Lynnette ZL1LL and Tom ZL1TO. The Meet was based at Glenelg. Forty seven YLs attended from around the world and 23 OMs. Many of the overseas YLs had very good memories of their time in New Zealand for YL2000 at Hamilton in 2000.

WARO members at the WARO AGM in Nelson; (l-r) Maxine ZL1FW, Judy ZL2OBE, Topsy ZL2LS, Lynne ZL2LKW, Sharon ZL2BQ, Angela ZL2TI, Bev ZL3OV, Jeanette ZL3DYL,Heather ZL2TYF. Sitting front row; Jolene ZL1UJB, Margaret ZL1MB, Lynette ZL1LL.

Bev ZL3OV receiving the Myrtle Earland Rosebowl from Lynette ZL1LL.

Saturday morning was the conference meeting with various YLs giving talks and expressing greetings. The men visited the museum of the South Australia Electricity Trust whose activities included construction of generating stations, setting up coal mines, distributing the electricity and even making home appliances. They had a enjoyable time I believe.

Trips were organized around Adelaide including Hahndorf, a Port Adelaide River Cruise, a Barossa Valley progressive day tour having wine tastings and one course of the menu at each of three stops. We also saw Australian animals in the Adelaide Hills at the Cleland wild life park, including kangaroos, koalas, wombats etc.

After the Meet 23 YLs and OMs set off by plane to Alice Springs (the Ghan was cancelled!) and some went on later by the Ghan to Darwin.

The Meet was enjoyed by all and Tina VK5TMC is to be congratulated for her organization of this event.

ALARA News

Tina VK5TMC has completed her

WARO members at Adelaide.

Satellite Orbits

Andrew Barron ZL3DW
<ad.barron@xtra.co.nz>

On July 2 and July 4. Bill Dzurilla NZ5N operating from Slovakia as OM3BD (grid JN88) reported a successful contact via AO-7 Mode B with Wyatt Dirks AC0RA (grid EN31). The GPS-measured distance between grids JN88 and EN31 is 7849 km, setting a new AO-7 distance record. When you consider that the distance between Christchurch and Perth is 5053 km and is considered to be a pretty long distance for a satellite QSO from New Zealand, you can see that this is a very good effort. The theoretical maximum coverage of AO-7 is estimated at 27 km. Bill used an FT847, 2 x 10 element Yagi on 2 m with SP2000 preamp, and an 8 element Yagi for 70 cm. Wyatt also used an FT-847, along with a 7 element Yagi on 2 m and a 12 element Yagi on 70 cm (no preamp).

Erin King, AK4JG, a 17-year-old from Columbus, Georgia, who refounded her high school's radio club and then lofted a ham radio-carrying balloon to over 27 km (91 000 ft), recovered the flight data and used it to produce a truly striking video <http://tinyurl.com/ak4jg-space-video> of that flight, has been named as recipient of the 2012 Amateur Radio Newsline Young Ham of the Year Award. OK it's not a satellite but it is a cool video and a great achievement for a new ham.

The Japan Aerospace Exploration Agency (JAXA) has announced the launch on July 21 of the HTV3 which will deliver the JEM-Small Satellite Orbital Deployer (J-SSOD) to the International Space Station (ISS). J-SSOD will enable small satellites to be deployed from the ISS using the Japanese Experiment Module (JEM) robot arm. The Japanese amateur radio satellites WE-WISH and FITSAT-1, along with San Jose State University's TechEdSat and the Vietnamese F-1 will also be delivered to the ISS on this launch and it is planned they will be deployed from the ISS on September 20.

Sounds from space. Matthias DD1US has a very impressive website which includes this page which has recordings of QSOs and beacons from early satellites and even EME. <http://www.dd1us.de/spacesounds%202.html>

The amateur radio satellite HORYU-2 was successfully launched on Thursday, May 17 at 1639 UT and its signals have been received by radio amateurs around the world. Built by students at the Kyushu Institute of Technology (KIT) HORYU-2 is 350 x 310 x 315 mm and its mass is 7.1 kg. It was launched into a Sun-Synchronous 680 km orbit with an inclination of 98.2°. The satellite's call-sign is JG6YBW and radio amateurs are asked to listen for the 437.375 MHz (±9 kHz Doppler shift) telemetry downlink that will be using 20 wpm Morse Code or 1200 bps AX.25 FSK packet radio.

PW_Sat the first Polish satellite was successfully deployed on the 13 of February 2012 from the new European rocket Vega. A report from Armando N8IGJ in May stated "PWsat transmits irregularly but can usually be heard every daylight pass. For what little I can get from the PWsat web site (in Polish) it seems to have a power problem. It's de-orbit sail has not yet been deployed. No mention on the web site of when or if the AO-16 style repeater would be turned on". Current status is unknown but AMSAT are listing it as 'operational'.

Erin King AK4JG, a 17 year old, launches a ham radio-carrying balloon to 27 km (91 000 ft).

LEO satellites with working transponders are AO-07, FO-29, VO-52 and SO-50. Actually AO-27 is too but it has never been workable from ZL as it is only turned on over the northern hemisphere. There are also many micro-sats and cubesats with active telemetry beacons.

On a non satellite note, I have been very busy with my new Flex-1500™ SDR radio. The 1500 is a QRP radio with 5 W output so I employed the 10 W preamp and 100 W power block plus low pass filters off an old FT-301 to serve as a 100 W linear fed from the radio's 1mW transverter output. The software that is bundled with the Flex radio is excellent in most respects but I was not 100% happy with the memory functions. Also it is difficult juggling the MixW digi-mode software and the SDR software on a single monitor. So I wrote a piece of software called CATbuttons to store and retrieve frequencies filter settings and modes. It is simple to use and works like the buttons on a car radio. CATbuttons can also set, via CAT commands, the mute, filter and mode while the SDR screen remains minimised, effectively working like a tool bar above or below the digi-mode software. I made the application available to anyone for free, and it caused quite a stir when someone listed it on QRZ news. Having got sick of answering a hundred emails, I decided that a website was the way to go, so I had to create one. You can check it out at <www.qsl.net/zl3dw>. I am now working on version 2 of my ADIF to KML converter, which takes a ham log in ADIF format containing Maidenhead grids and places your log details on Google Earth. So you can see all of your QSOs plotted on the map, click to show the QSO details and double click to zoom into the grid. Version1 required Excel on your PC but the new version does not as it does all of the work inside the application.

As always I am keen to hear about and publish details about your satellite activities, so please drop me an email to <zl3dw@nzart.org.nz> and photos are especially useful. I am also very happy to answer any questions that have you puzzled or will help you get started.

73 *Andrew ZL3DW*

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term as President of ALARA and Jean VK3VIP is the new President. The next ALARAMeet will be held at Nelson Bay, New South Wales at the end of October 2014.

Lynnette ZL1LL

Branch 26 Knitted hand warmers

Due to the high number of requests for these here is the pattern to knit your own.

Using 6 mm needles and triple knit wool, cast on 26 stitches, and knit whatever pattern you like to the desired length then cast off loosely. Sew up side seem and leave small opening for your thumb to go through. Wear and keep warm. You can decorate with buttons, lace or whatever. Different size needles and wool make difference size warmers. Have fun ☺

What better time to get this when the weather is so cold and chilly, these will certainly help keep you warm.

WARO Email Address

We need articles for the WARO page all the time. If you do not send in anything then you won't get anything published. The WARO email address is: <waro@nzart.org.nz>.

You are all doing different things with in your club or with other WARO members so please tell us as we would all like to keep in touch with what each club and members are doing. The WARO page is only as good as you want to make it, it is your page, not just the *Break-In* columnist; so please send in your articles. Many thanks.

Topsy ZL2LS, Ngaire ZL2UJT

Contests

Contest Manager: Frank Hunt ZL2BR
<2bfrank@orcon.net.nz>

Commonwealth Contest 2012

Congratulations to all ZL's who operated in this contest. Full results are available at: <www.rsgbcc.org/cgi-bin/hfresults.pl?Contest=Commonwealth%20Contest&year=2012>. In addition the write-up at <www.beru.org.uk> is well worth a read.

International HF Contest Calendar for August/September 2012

Contest	Dates	Times (UTC)	Website
WAE (Worked All Europe) CW Contest	Aug 11/12	0000 UTC Sat – 2400 UTC Sun	<www.darc.de/referate/dx/contest/waedc/en/rules/>
SARTG (Scandinavian) RTTY Contest	Aug 18/19	0000-0800, 1600-2400 & 0800-1600 UTC	<www.sartg.com/contest/wwrules.htm>
SCC (Slovenian) RTTY Contest	Aug 25/26	1200 UTC Sat – 1200 UTC Sun	<lea.hamradio.si/~scc/rtty/htmlrules.htm>
All Asian SSB Contest	Sep 1/2	0000 UTC Sat – 2400 UTC Sun	<www.jarl.or.jp/English/4_Library/A-4-3_Contests/2012AA_rule.htm>
WAE (Worked All Europe) SSB Contest	Sep 8/9	0000 UTC Sat – 2400 UTC Sun	<www.darc.de/referate/dx/contest/waedc/en/rules/>
SAC (Scandinavian Activity Contest)	Sep 15/16	1200 Sat – 1200 UTC Sun	<www.sactest.net/#tabs-6>
CQ WW RTTY Contest	Sep 22/23	0000 UTC Sat – 2400 UTC Sun	<www.cqwpxrtty.com>

ZL Results

Call-sign	Hours category	Contacts						Score
		80	40	20	15	10	All	
Open Section								
ZL3IO	24	36	84	108	46	13	287	4655
ZM4G	24	31	70	125	35	16	277	4485
ZL2BR	24	12	101	61	30	12	216	3660
ZL3TE	24	13	56	55	23	17	164	3520
ZL3NB	24	18	44	55	14	5	136	2660
ZL3AB	12	7	36	7	6	4	60	1320
ZL2AL	24	1	29	15	10	0	55	1275
ZL3PAH	12	3	20	5	3	0	31	695
ZL2AYZ	12	0	4	11	2	0	17	425
Restricted Section								
ZL7/VO1AU	24	18	78	58	12	5	171	3295
ZL3XX	12	0	10	6	0	0	16	400
ZL2RV	12	0	3	4	4	0	11	275
ZL3DMC	12	0	7	2	0	0	9	225
Multi-Op Section								
ZL3GA	–	2	25	23	8	5	63	1455
HQ Section								
ZL1AMO*	–	36	196	172	84	22	510	6850

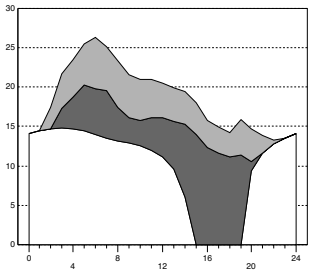
*Operators: ZL1AIH, ZL1GO, ZL3CW, ZL3WW, ZL1BHQ

Team Competition Results

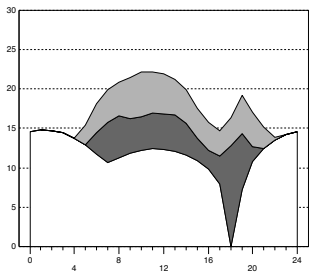
Team	Operators					Score
Team Caribbean/Atlantic	6Y0A	J88DR	VP9/G3PJT	ZD7XF	ZF1UM	48 621
Team Australia	VK2BJ	VK2PN	VK3TDX	VK4EMM	VK6LW	47 551
Team New Zealand	ZL2BR	ZL3IO	ZL3TE	ZL7/VO1AU	ZM4G	35 110
Team Canada Eh?	VE3EJ	VE3FU	VE3KI	VE7CC	XL3T	35 030
Team Mediterranean & West Africa	9H3C	9H3ET	C4Z	C56XA	ZB2EO	34 030
Team Scotland	GM0GAV	GM0NAI	GM3POI	GM3SEK	GM3WUX	29 105
Team UK Christmas Islanders	G0KPW	G3RWL	G3WPH	G3YBY	G6PZ	24 135
Team MCC Canada	VE1AL	VE1OP	VE1ZJ	VE9HF	VE9ML	21 890
Team Thames Valley	G0OPB	G0ORH	G3VPW	G3XTT	M0DHO	21 145
Team Essex CW ARC	G0DVJ	G0IBN	G3BJ	G3GLL	G3YEC	15 745
Team Canada 'B'	VA3DX	VE3ZI	VO1HP			12 740
Team ZL3 Earthquake Survivors	ZL3AB	ZL3GA	ZL3NB	ZL3DMC	ZL3PAH	11 375
Team S'Toon	VA5LF	VE5UO	VE5VA	VE5ZX		1935

Ionospheric Predictions

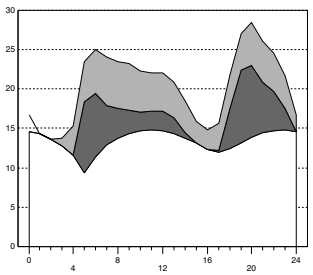
SEPTEMBER / OCTOBER 2012 T-index = 82



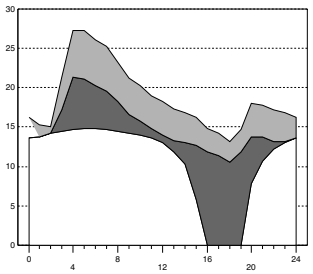
WN-
Moscow
(SP)
16548 km
312°



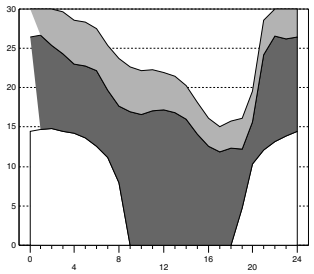
WN-
London
(SP)
18814 km
343°



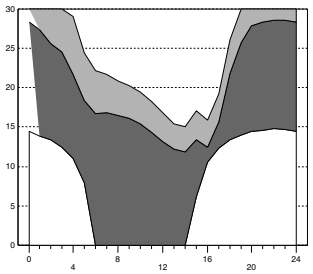
WN-
Jo'burg
(LP)
28265 km
31°



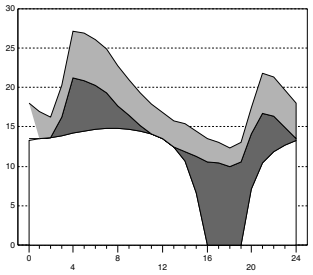
WN-
Istanbul
(SP)
17168 km
281°



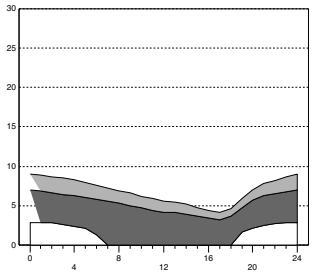
WN-
Tokyo
9274 km
332°



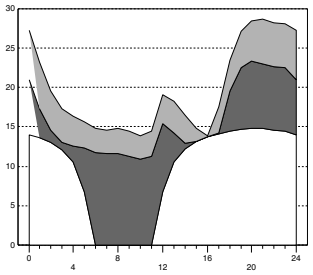
WN-
San
Francisco
10859 km
45°



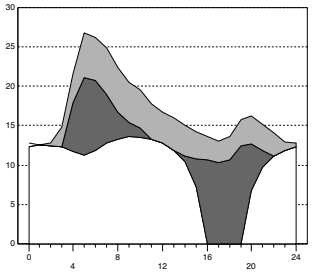
WN-
Cairo
16519 km
261°



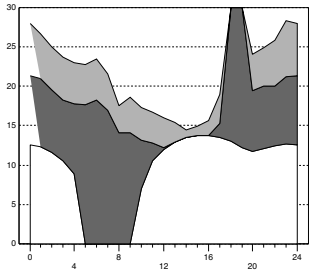
WN-
New
Zealand
300 km



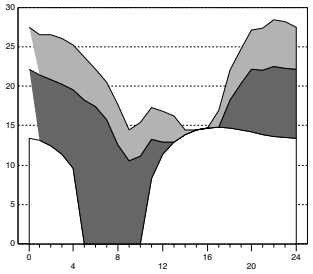
WN-
New
York
14402 km
66°



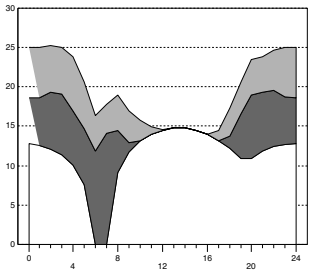
WN-
Jo'burg
(SP)
11759 km
211°



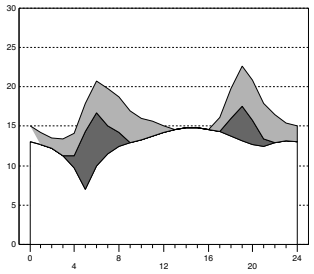
WN-
Rio de
Janeiro
11780 km
144°



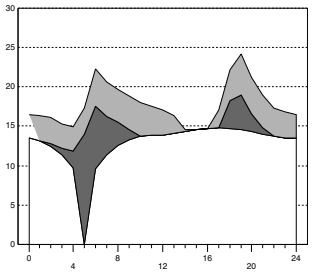
WN-
Barbados
13962 km
104°



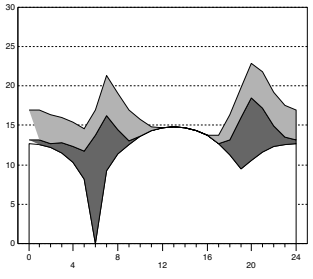
WN-
Dakar
16862 km
155°



WN-
Moscow
(LP)
23476 km
132°



WN-
Istanbul
(LP)
22856 km
101°



WN-
London
(LP)
21210 km
163°

Horizontal axis shows time in UTC.

Vertical axis shows frequency.

Propagation is possible in the shaded areas, with best operation in the darker area.

These predictions are based on solar activity data supplied by IPS Radio and Space Services.

See pages 6–9, Break-In May/June 2004 "Choosing the Best Frequency" by the late John Gabites ZL2AQ for interpretation of forecasts and explanation of terms MUF, OWF and ALF.

HAMADS

WANTED: RADIO VALVES. Cash paid for old radio and TV valves. Prefer new in boxes. Telephone (09) 528-2022 or E-mail <paul.ssegrub01@gmail.com>

WANTED: FT-790RII All Mode 70cm transceiver going or not with the clipon 25W linear amplifier (FL-7025) or just the amplifier. Kevin ZL3DAC. Telephone (03) 789-9875.

WANTED: R25 – ARC5 receiver 1.5 – 3.0 MHz, ARC5 3 or 4 unit receiver rack MT65 – ARC5 and MT67 – ARC5. Components from BC348 receivers audio filter, output transformer, dynamotor. ZL2ANS. Telephone (06) 844-2039 or 111 Avenue Rd, Greenmeadows, Napier 4112.

FOR SALE : Kenwood TS830S with microphone. Complete but not in working condition. No manual. Offers. ZL4QN. Telephone (03) 698-8480 or *Call Book* Address.

FOR SALE: Kenwood TS830S with external separate 2nd VFO230 fitted with optional 12 volt power supply. Make an offer. ZL1ABL. E-mail <alanjd@infogen.net.nz> or *Call Book* Address.

WANTED: Had remote head of my FT-8100 stolen. Still got tranceiver. Need to buy replacement head. Anybody there with a dead FT-8100? Bill ZL4AE. Telephone (027) 552-2221 or E-mail <b_olsen@xtra.co.nz>

FOR TENDER: Icom HF/50MHZ All mode transceiver IC-756 ProIII. Unit was stolen and has been recovered. Unit is in good condition and can be viewed at AMI insurance, 116W Heretaunga Street, Hastings. Unit does not come with any cables. Please send your tenders to <hastings@ami.co.nz> attention Blair Little. Successful tender will need to arrange pick up from AMI Hastings. Tenders close on the 30 August 2012. Highest or Any Tender Not Necessarily Accepted.

Next deadline for copy is
10 September 2012

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LCD display • Direct frequency entry
SW (100-29999 KHz) • SSB •
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Australia
Ph +61-2-9939 4377
Fax: +612 9939 4375
michael@avcomm.com.au
www.avcomm.com.au

REMEMBER:

Leave a three second pause between overs when using repeaters.

Someone else may have an urgent message.

Hamilton Amateur Radio Club

MARKET DAY

Saturday
11 August, 2012

Waikato Table Tennis Stadium
Edgecumbe Street

Vendors from 8am
Buyers from 10am

Table space at $20 per metre (prepaid)
$25 per metre on the day.

All enquiries to:
Market Day
Hamilton Amateur Radio Club,
PO Box 606, Hamilton.
E-mail: harcmday@nzart.org.nz
Web www.zl1ux.tripod.com/market_day.html

Hamads and Classified Advertising in *Break-In*

Hamads up to 30 words are now free as a service to members but the following conditions will apply:

(1) Hamads. A single, free Hamad in each issue of *Break-In* is only available to financial members and Branches of NZART buying or selling personal equipment. Members and Branches wishing to use this service must include their NZART Membership Number or other evidence of membership. If possible they should use the official HAMAD form (on the reverse of their address sheet). If this is not convenient the advert may be emailed or sent typed double-spaced, but proof of current membership must be provided.

Each free Hamad is limited to 30 words; any extra words will be charged at the current rate of 25c per word, telephone and fax numbers count as two words each, e-mail addresses and *Call Book* address as three words each. All prices include GST. Free Hamads will also be accepted for sales of deceased estates where the member was a financial member of NZART during the past 12 months and from branches who are financial members of NZART (ie have a Membership No).

Advertisements are accepted in good faith from amateurs and may only be used be the sale of used radio and allied equipment. The Association, or its representatives, can take no responsibility for them nor take part in any discussion resulting from sales or purchases; remember "Caveat emptor". In case of dispute, the Editor's decision is final.

Trade or business adverts, even from members, will not be accepted here, since this is a subsidised service to members.

(2) Classified Advertisements are available to members, non-members and commercial firms offering products or services for sale, etc. All adverts not meeting the Hamad criteria will be considered to be Classified Advertisements.

Classified Advertisements will be charged at 40c per word. Bold type is available at 50c per word. For semi-display (ie rule above and below) add $5.00. All Classified Advertisements must be pre-paid, receipts will not be given. All prices include GST.

(3) Display style adverts will be still be charged for at the current rates.

(4) Closing date. Please send Hamads and Classified Advertisements to The Advertising Manager, PO Box 1733, Christchurch, to be received no later than the 10th of the month prior to publication. Please make cheques payable to NZART; no cash or credit cards. The Editor and NZART Inc reserve the right to discontinue or decline any advertisement.

For further information and commercial advertising rates, please contact:
Lorne Douglas ZL2AHB, Advertising Manager, c/- PO Box 1733, Christchurch. Telephone (03) 358-9100. E-mail: <hamads@nzart.org.nz>.

Calling Rotarians who are NZ Amateur Radio Operators

<www.ifroar.org>

The International Fellowship of Rotarians of Amateur Radio is another way in which licenced radio operators can extend their service and fellowship. A New Zealand network is being re-kindled by a few Rotarians who regularly connect with their Australian and European counterparts on 40 m and 20 m. We wish to grow the New Zealand fellowship, develop its character and contribute to Rotary's ideals. We would love to hear from you if you wish to participate.

If you would like to know more, please contact Dr John Moriarty (ZL2JPM) of the Rotary Club of Port Nicholson via <john@moriarty.biz> or 027 4926458.

The busy Radio Tek session.

Vice-Pres Stuart Watchman, President Vaughan Henderson, Business Manager Debby Morgan and Treasurer Evan Sayer ran the AGM.

Balladeer Roger Lusby entertained delegates after dinner.

AMSAT forum.

Members of the Alternative Programme enjoying morning tea before setting off.

Kelvin Barnsdale ZL3KB receiving his Arthur Godfrey Award.

Alan Wooller ZL1AUW, received an Arthur Godfrey Award.

Topsy ZL2LS and Sharon ZL2BQ ably compéred the Sunday evening after dinner entertainment.

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GPS Receiver

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